

NOV. 27

AN ANTENNALESS SET

15 CENTS

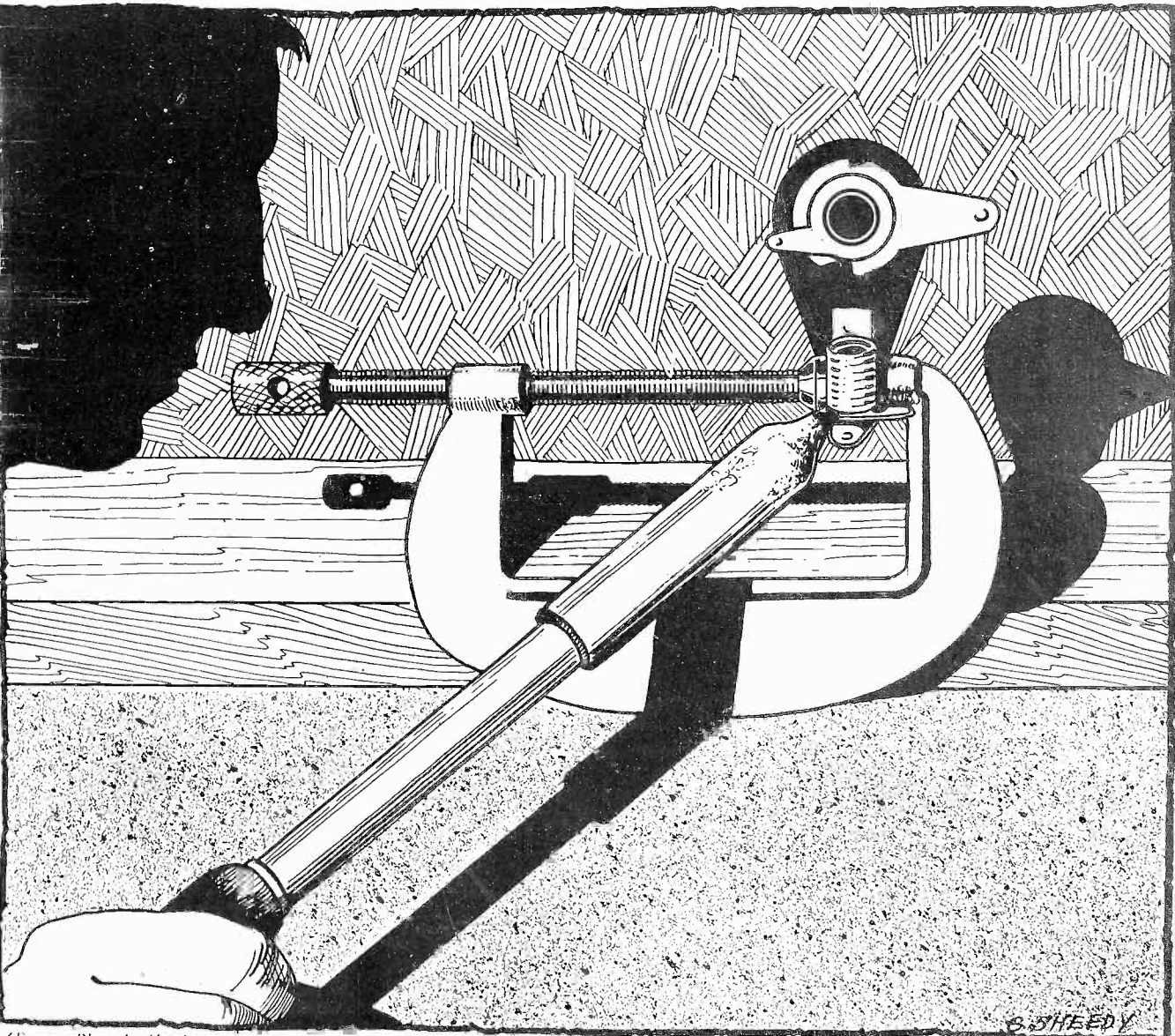
1927

RADIO WORLD

Reg. U. S. Pat Off.

America's First and Only National Radio Weekly
Vol. 10 No. 10 *24* Illustrated

IN THIS ISSUE—Sir Oliver Lodge's Non-Radiating N Circuit—World-Wide Check-Up on Short Wave Phenomena—Trouble-Shooting in B Battery Eliminators—Complete List of Broadcasting Stations



(From a Photo by Hayden)

A Small Clamp May be Used as a Vise to Hold a Small Object You Desire to Solder. Secure the Clamp to a Board

RADIO NEWS RADIO WORLD GIVE BST-5 CERTIFICATE OF MERIT

A \$75 Set Direct from Factory at \$40

I received my B. S. T. radio set two weeks ago and I am very well pleased with it.

I had the set working in fifteen minutes and at the end of two hours and a half I had twenty-nine stations logged. The set brings in new stations almost every night.

The cabinet is very well constructed and the people that have seen it say that it is a very beautiful set.

G. C. PARRISH, Dallas, Oregon.

GUARANTEE

Satisfaction or Money Back

Each receiver is tested and retested, boxed and inspected before leaving factory, and guaranteed to reach you direct in perfect condition. Workmanship throughout guaranteed the best. Assembled by experts.

Renaissance Model Console

With built-in Utah Unit Loud Speaker and commodious compartment in which there is ample room for batteries, charger, eliminators, etc.

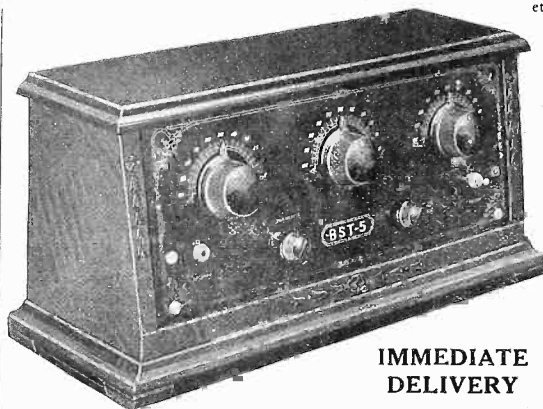
**COMPLETE
RECEIVER
BST-5
Loud Speaker
and Console**

\$57.00

As Illustrated

\$40.

Send Check or
P. O. Money Order



**IMMEDIATE
DELIVERY**

New model cabinet, Du Pont Duco finish; base 21" long by 8" wide, height 9½", top 21" by 6". Five-ply walnut veneer piano finish.

THIS highly sensitive, powerful and selective BST-5 radio receiver has all up-to-the-minute improvements. Heavy aluminum automobile type chassis, shielded against stray currents and distortion. Flexible grip, Universal type sockets, eliminating microphonic noises. Has provision for battery eliminator and any power tube. Fahnestock clips on sub-panel for adjusting C battery, has voltages for power tube. Efficient on either long or short aerial, including indoor aerial. This BST-5 sets a new standard for true tone values and selectivity. This BST-5 gives greater volume than many six-tube sets and consumes less current.

GUARANTY RADIO GOODS CO.

145 West 45th Street

New York, N. Y.

RADIO WORLD Guarantees the Responsibility of This Advertiser

FILL OUT AND MAIL NOW

SUBSCRIPTION BLANK

RADIO WORLD

RADIO WORLD

145 West 45th Street, New York City
(Just East of Broadway)

Please send me RADIO WORLD for months, for which

please find enclosed

SUBSCRIPTION RATES:

Single Copy.....\$.15
Three Months.....1.50
Six Months.....3.00
One Year, 52 Issues.....6.00
Add \$1.00 a Year for Foreign
Postage: 50c for Canadian Post-
age.

City and State

Good Back Numbers of RADIO WORLD

The following illustrated articles have appeared in recent issues of RADIO WORLD:

1926:

- Mar. 6—The 1-Tube Set, by Capt. O'Rourke. The Chemistry of Batteries, by A. B. Reid.
- Mar. 13—The Non-Regenerative Browning-Drake Set (Part 1), by M. B. Sleeper. The Tectron Eliminator, by Lewis Winner.
- Mar. 20—The Super-Heterodyne, by J. E. Anderson. A 2-Tube Speaker Set, by Percy Warren. The Browning-Drake Set (Part 2), by M. B. Sleeper.
- Mar. 27—An Economical 4-Tube Set, by Edgar T. Collins. A Practical B Battery, by Capt. P. V. O'Rourke. Tectron Trouble Shooting, by Lewis Winner.
- April 3—How to Get DX, by Capt. P. V. O'Rourke. A Compact B Supply, by Lewis Winner.
- April 17—The New 1-Dial Powertone, by Capt. P. V. O'Rourke. The Action of Transformers, by Lewis Winner.
- May 1—New Multiple Tube, by Herman Bernard. The Aero All-Wave Set, by Capt. O'Rourke. Kilocycle-Meter Chart. An Analysis of Detection, by J. E. Anderson (Part 1).
- May 8—A Study of Detection, by J. E. Anderson (Part 2). To Wind a Loop on a Card-board Frame. How to Reflex Resistance A.F., by Theo. Kerr.
- May 15—Super-Heterodyne Results Brought Up to Maximum, by Herman Bernard. The Truth About Coil Fields, by J. E. Anderson.
- May 22—A Built-In Speaker Set, by Herbert E. Hayden. The Powertone in Operation, by Capt. P. V. O'Rourke.
- May 29—Aerials in Ground and water, by Lewis Winner. Economized Filaments, by J. E. Anderson. How to Get DX, by John F. Ricker.
- June 5—Five-Tube Compact Receiver, by J. E. Anderson. A Tester for Tube Circuits, by Spencer Hood. Problems of Portables, by Hugo Gernsback.
- June 19—Selectivity's Amazing Toll, by J. E. Anderson. The Light 5-Tube Portable Set, by Herman Bernard (Part 2). The 4-Tube Rogers-Schudt, by Wm. A. Schudt, Jr. (Part 2).
- July 3—Set with a 1-Turn Primary, by Herman Bernard. Part 2 of the Victoreon Portable, by H. Bernard. Trouble Shooting Article for The Light 5-Tube Portable.
- July 10—A Bub in Single Control, by Herman Bernard. A DX Double Regenerator, by Capt. P. V. O'Rourke. A 2-Tube Dry Cell Receiver, by Samuel Schmalz.
- July 17—A Double Duty Loop Aerial, by J. E. Anderson. How to Measure Coupling, by John Rider. A 1-Control Crystal Set, by Smedley Lyons.
- July 24—Why the Super-Heterodyne Is the Best Set, by Herman Bernard. A 1-Tube Reflex Receiver, by H. A. Reed.
- July 31—What's Best in an A.F. Amplifier, by Herman Bernard. A 6-Tube Reversed Feedback Set, by K. B. Humphrey.
- Aug. 7—The 5-Tube Tabloid, by A. Irving Witz. The Wiring of Double Jack, by Samuel Lager.
- Aug. 14—The Improved Browning-Drake, by Herman Bernard (Part 1). Storage Batteries, by John A. White.
- Aug. 21—A New Stabilized Circuit, by E. H. Loftin and S. Y. White (Part 1). The Browning-Drake, by Herman Bernard (Part 2).
- Aug. 28—The Constant Coupling, by E. H. Loftin and S. Y. White (Part 2). The Browning-Drake, by Herman Bernard (Part 3).
- Sept. 4—The Four Rectifier Types, by K. B. Humphrey. A Simple Battery Charger, by J. E. Anderson.
- Sept. 11—The Beacon (3-tubes), by James H. Carroll. The 1927 Model Victoreon, by Herman Bernard.
- Sept. 18—The 1927 Victoreon, by Arthur H. Lynch. Eliminator in a Cash Box, by Paul R. Fernald.
- Sept. 25—The Lynch Lamp Socket Amplifier, by Arthur H. Lynch. Wiring up the Victoreon, by Herman Bernard.
- Oct. 2—The Victoreon (Continued), by Herman Bernard. New Equamatic System, by Capt. P. V. O'Rourke.
- Oct. 9—A Practical "A" Eliminator, by Arthur H. Lynch. Building the Equamatic, by Capt. P. V. O'Rourke.
- Oct. 16—The Bernard, by Herman Bernard. How to Box an "A" Supply, by Herbert E. Hayden.
- Oct. 23—The 5-tube P. C. Samson, by Capt. P. V. O'Rourke. Getting DX on the Bernard, by Lewis Winner.
- Oct. 30—The Singletrot Receiver, by Herbert E. Hayden. How to Get Rid of Squeals, by Herman Bernard.
- Nov. 6—Reduction of Interference, by A. N. Goldsmith. Variations of Impedances, by J. E. Anderson.
- Nov. 13—The 4-tube Hi-Power Set, by Herbert E. Hayden. A Study of Eliminators, by Herman Bernard.

Any copy, 15c. Any 7 copies, \$1.00. All these 33 copies for \$4.50, or start subscription with any issue. RADIO WORLD, 145 West 45th Street, New York City.

The Antennaless Receiver

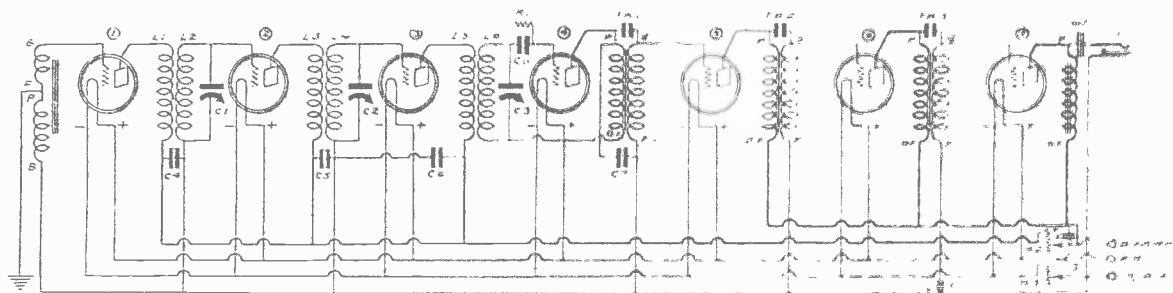


FIG. 1

In the Antennaless Receiver, the circuit diagram of which is shown schematically, an iron core radio frequency transformer of the untuned type is used in the first stage, followed by three tuned stages, one of which is the detector input. The coils and variable condensers are Benjamin. The audio channel is composed of three stages of Truphonic coupling, TR1, TR2 and TR3. The commercial audio units are complete and include encased coupling condensers.

Ground Connection Is Made to the Input and, With Suitable Audio Amplification, Affords All Sufficient Volume, Excellent Selectivity And Distance—Ground Wave Is Noted For Its Penetrating Quality

By Dr. Louis B. Blan

AS a great number of persons desire to do away with an outdoor or indoor aerial, a seven-tube receiver was designed that will meet these conditions. All one needs is a good ground connection, and this is brought to a joined pair of posts of a fixed or untuned, radio frequency transformer that has an iron core. In many instances even the ground may be supplanted successfully with a lamp socket antenna.

The untuned stage is followed by three tuned stages. The set is balanced against self-oscillation by reduction of the plate voltage, hence plate current, to the highest value consistent with avoidance of squeals. The negative bias on the radio frequency tube grids is automatic and is equal to the voltage drop in the rheostat R3, being about one volt.

Volume High, Tone Fine

In the audio channel three stages of Truphonic coupling are used, as these bring up the volume to the desired high level and afford excellent quality reproduction.

The filtered output method is used, to protect the speaker windings from the possibly injurious effect of passing direct current through them. Only the audible frequencies pass through the fixed condenser connected to jack, while the direct current flows through the choke coil.

The noise level is quite low in the Antennaless Receiver, and the selectivity is

high indeed, thus reducing very considerably the number and intensity of whistles usually experienced on account of the wave of one station beating against that of another.

Nor is the distance-getting, facility diminished because of the absence of an outdoor or indoor aerial. It is true, indeed, that a good outdoor aerial will intercept the waves much more strongly than any other system, but the additional stage of RF is included to make up for this as much as is necessary for full satisfaction, and to afford the aerialless advantage, which is one of convenience.

Uses the Ground Wave

Some say the tone quality is better on the type of receiver represented by the Antennaless. Certain it is that with the input softened, the noise level lowered and extraneous noises thus kept at minimum, the volume is achieved largely through the abundance of power in the audio channel. The situation is something like that present where a loop is used, since the advantages are of the same caliber. In the present instance, however, instead of using the magnetic component of the broadcast wave we use the capacity or electro-static component, yet only as to the ground wave.

It is well known that the ground wave is far more penetrating than the sky wave of the electro-static system of pick up, hence we are safe in assuming there is no loss of distance-getting power.

The design, however, must be utilized in toto, since merely a pair of audio stages scarcely would afford sufficient volume, and one fewer stage of RF would give only fair volume. It must be realized that radio frequency amplification is a volume increaser, besides a radio amplifier. Full, rich tone, of sufficient volume to satisfy almost anyone, is obtainable, and the method to follow is the one shown schematically in Fig. 1.

Suitable For Eliminator

The circuit as shown is adaptable to B battery eliminator. The detector tube will not self-oscillate, because the plate is connected through the primary of the first Truphonic coupler, TR1, to A plus. Hence no B voltage whatsoever is used on the detector tube, the plate potential be-

Circuit Design is Adaptable to B Battery Eliminator and May be Operated From a Maximum of 135 Plate Volts, Although Even 90 Will Work Well—Filtered Audio Output Is Used

ing about 5 volts positive, due to connection to A plus. The applied plate voltage is equal to the difference between the negative filament and the positive A. As the rheostat drops one volt, in other words, the filament voltage is 5, the plate voltage is 5 volts positive. This is enough for good detector action.

The maximum B plus connection is the only B lead that is brought to the set. It may be 135 to 90. The voltage is cut down from that maximum to radio frequency plate values by the 200-ohm variable resistor, R2. This should be suitably bypassed. C9, which is .001 mfd., serves that purpose. For R2 a potentiometer may be used, only it is connected in rheostat fashion. One post of the potentiometer is not used, but only the centerpost and one of the side posts.

The Ground Lead

For best results a ground to the cold water pipe or to a copper plate buried 10 feet in moist earth is advisable. A long lead from actual ground or pipe to the set is in no way objectionable. A connection to a radiator or hot air vent will not do, as this type of ground never is anything better than a poor or fair makeshift.

Good coils are necessary in the receiver. Those used in the laboratory were Benjamin.

The layout of the parts is special and will be discussed and illustrated next week. The placement of the coils and the location of the sockets are important in their effect on self-oscillation and its (Concluded on page 31)

RADIO NEWS RADIO WORLD GIVE BST-5 CERTIFICATE OF MERIT

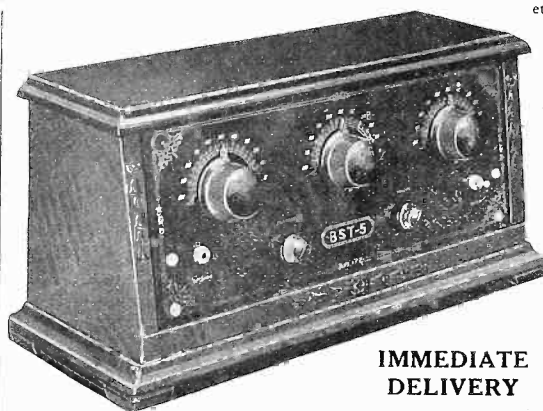
A \$75 Set Direct from Factory at \$40

I received my B. S. T. radio set two weeks ago and I am very well pleased with it.

I had the set working in fifteen minutes and at the end of two hours and a half I had twenty-nine stations logged. The set brings in new stations almost every night.

The cabinet is very well constructed and the people that have seen it say that it is a very beautiful set.

G. C. PARRISH, Dallas, Oregon.



**IMMEDIATE
DELIVERY**

New model cabinet, Du Pont Duco finish; base 21" long by 8" wide, height 9 1/2", top 21" by 6". Five-ply walnut veneer piano finish.

THIS highly sensitive, powerful and selective BST-5 radio receiver has all up-to-the-minute improvements. Heavy aluminum automobile type chassis, shielded against stray currents and distortion. Flexible grip, Universal type sockets, eliminating microphonic noises. Has provision for battery eliminator and any power tube. Fahnestock clips on sub-panel for adjusting C battery, has voltages for power tube. Efficient on either long or short aerial, including indoor aerial. This BST-5 sets a new standard for true tone values and selectivity. This BST-5 gives greater volume than many six-tube sets and consumes less current.

GUARANTY RADIO GOODS CO.

145 West 45th Street

New York, N. Y.

RADIO WORLD Guarantees the Responsibility of This Advertiser

FILL OUT AND MAIL NOW

SUBSCRIPTION BLANK

RADIO WORLD

RADIO WORLD

145 West 45th Street, New York City
(Just East of Broadway)

Please send me RADIO WORLD for months, for which

please find enclosed

SUBSCRIPTION RATES:

Single Copy.....\$.15
Three Months..... 1.50
Six Months..... 3.00
One Year, 52 Issues..... 6.00
Add \$1.00 a Year for Foreign
Postage; 50c for Canadian Post-
age.

City and State

GUARANTEE

Satisfaction or Money Back

Each receiver is tested and retested, boxed and inspected before leaving factory, and guaranteed to reach you direct in perfect condition. Workmanship throughout guaranteed the best. Assembled by experts.

**Renaissance
Model Console**

With built-in Utah Unit Loud Speaker and commodious compartment in which there is ample room for batteries, charger, eliminators, etc.

**COMPLETE
RECEIVER
BST-5
Loud Speaker
and Console**

\$57.00

As Illustrated

\$40.

Send Check or
P. O. Money Order

Good Back Numbers of RADIO WORLD

The following illustrated articles have appeared in recent issues of RADIO WORLD:

1926:

- Mar. 6—The 1-Tube Set, by Capt. O'Rourke. The Chemistry of Batteries, by A. R. Reid.
- Mar. 13—The Non-Regenerative Browning-Drake Set (Part 1), by M. S. Sleeper. The Tecton Eliminator, by Lewis Winner.
- Mar. 20—The Super-Heterodyne, by J. E. Anderson. A 2-Tube Speaker Set, by Percy Warren. The Browning-Drake Set (Part 2), by M. S. Sleeper.
- Mar. 27—An Economical 4-Tube Set, by Edgar T. Collins. A Practical B Battery, by Capt. P. V. O'Rourke. Tecton Trouble Shooting, by Lewis Winner.
- April 3—How to Get DX, by Capt. P. V. O'Rourke. A Compact B Supply, by Lewis Winner.
- April 17—The New 1 Dial Powerline, by Capt. P. V. O'Rourke. The Action of Transformers, by Lewis Winner.
- May 1—New Multiple Tube, by Herman Bernard. The Aero All-Wave Set, by Capt. O'Rourke. Kilocycle-Meter Chart. An Analysis of Detection, by J. E. Anderson (Part 1).
- May 8—A Study of Detection, by J. E. Anderson (Part 2). To Wind a Loop on a Card-board Frame. How to Reflex Resistance AF, by Theo. Kerr.
- May 15—Super-Heterodyne Results Brought Up to Maximum, by Herman Bernard. The Truth About Coil Fields, by J. E. Anderson.
- May 22—A Built-in Speaker Set, by Herbert E. Hayden. The Powerline in Operation, by Capt. P. V. O'Rourke.
- May 29—Aerials in Ground and water, by Lewis Winner. Economized Filaments, by J. E. Anderson. How to Get DX, by John F. Rider.
- June 5—Five-Tube Compact Receiver, by J. E. Anderson. A Tester for Tube Circuits, by Spencer Hood. Problems of Portables, by Hugo Gernsback.
- June 19—Selectivity's Amazing Toll, by J. E. Anderson. The Light 5-Tube Portable Set, by Herman Bernard (Part 2). The 4-Tube Rogers-Schmidt, by Wm. A. Schmidt, Jr. (Part 2).
- July 3—Set with a 1-Turn Primary, by Herman Bernard. Part 2 of the Victoreen Portables, by H. Bernard. Trouble Shooting Article for The Light 5-Tube Portable.
- July 10—A Rub in Single Control, by Herman Bernard. A DX Double Regenerator, by Capt. P. V. O'Rourke. A 2-Tube Dry Cell Receiver, by Samuel Schmatz.
- July 17—A Double Duty Loop Aerial, by J. E. Anderson. How to Measure Coupling, by John Rider. A 1-Control Crystal Set, by Smedley Lyons.
- July 24—Why the Super-Heterodyne Is the Best Set, by Herman Bernard. A 1-Tube Reflex Receiver, by H. A. Reed.
- July 31—What's Best in an AF Amplifier, by Herman Bernard. A 6-Tube Reversed Feedback Set, by K. B. Humphrey.
- Aug. 7—The 5-Tube Tabloid, by A. Irving Witiz. The Wiring of Double Jack, by Samuel Lager.
- Aug. 14—The Improved Browning-Drake, by Herman Bernard (Part 1). Storage Batteries, by John A. White.
- Aug. 21—A New Stabilized Circuit, by E. H. Loftin and S. Y. White (Part 1). The Browning-Drake, by Herman Bernard (Part 2).
- Aug. 28—The Constant Coupling, by E. H. Loftin and S. Y. White (Part 2). The Browning-Drake, by Herman Bernard (Part 3).
- Sept. 4—The Four Rectifier Types, by K. B. Humphrey. A Simple Battery Charger, by J. E. Anderson.
- Sept. 11—The Beacon (3-tubes), by James H. Carroll. The 1927 Model Victoreen, by Herman Bernard.
- Sept. 18—The 1927 Victoreen, by Arthur H. Lynch. Eliminator in a Cash Box, by Paul R. Fernald.
- Sept. 25—The Lynch Lamp Socket Amplifier, by Arthur H. Lynch. Wiring up the Victoreen, by Herman Bernard.
- Oct. 2—The Victoreen (Continued), by Herman Bernard. New Equamatic System, by Capt. P. V. O'Rourke.
- Oct. 9—A Practical "A" Eliminator, by Arthur H. Lynch. Building the Equamatic, by Capt. P. V. O'Rourke.
- Oct. 16—The Bernard, by Herman Bernard. How to Box an "A" Supply, by Herbert E. Hayden.
- Oct. 23—The 5-tube P. C. Samson, by Capt. P. V. O'Rourke. Getting DX on the Bernard, by Lewis Winner.
- Oct. 30—The Singletrol Receiver, by Herbert E. Hayden. How to Get Rid of Squeals, by Herman Bernard.
- Nov. 6—Reduction of Interference, by A. N. Goldsmith. Variations of Impedances, by J. E. Anderson.
- Nov. 13—The 4-tube Hi-Power Set, by Herbert E. Hayden. A Study of Eliminators, by Herman Bernard.

Any copy, 15c. Any 7 copies, \$1.00. All these 33 copies for \$4.50, or start subscription with any issue. RADIO WORLD, 145 West 45th Street, New York City.

The Antennaless Receiver

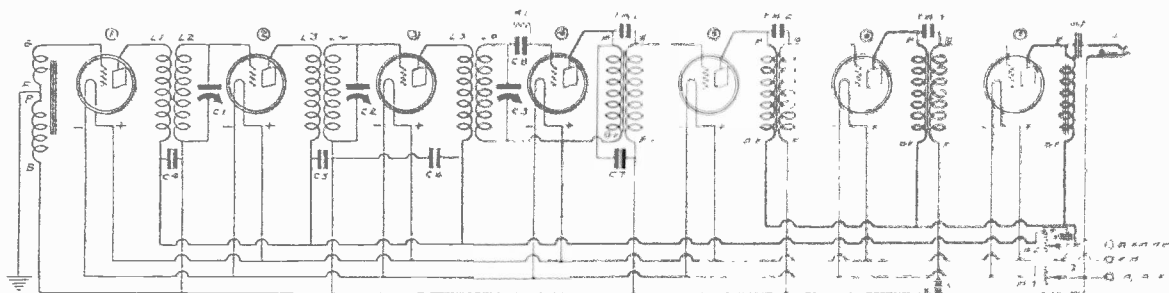


FIG. 1

In the Antennaless Receiver, the circuit diagram of which is shown schematically, an iron core radio frequency transformer of the untuned type is used in the first stage, followed by three tuned stages, one of which is the detector input. The coils and variable condensers are Benjamin. The audio channel is composed of three stages of Truphonic coupling, TR1, TR2 and TR3. The commercial audio units are complete and include enclosed coupling condensers.

Ground Connection Is Made to the Input and, With Suitable Audio Amplification, Affords All Sufficient Volume, Excellent Selectivity And Distance—Ground Wave Is Noted For Its Penetrating Quality

By Dr. Louis B. Blan

AS a great number of persons desire to do away with an outdoor or indoor aerial, a seven-tube receiver was designed that will meet these conditions. All one needs is a good ground connection, and this is brought to a joined pair of posts of a fixed or untuned, radio frequency transformer that has an iron core. In many instances even the ground may be supplanted successfully with a lamp socket antenna.

The untuned stage is followed by three tuned stages. The set is balanced against self-oscillation by reduction of the plate voltage, hence plate current, to the highest value consistent with avoidance of squeals. The negative bias on the radio frequency tube grids is automatic and is equal to the voltage drop in the rheostat R3, being about one volt.

Volume High, Tone Fine

In the audio channel three stages of Truphonic coupling are used, as these bring up the volume to the desired high level and afford excellent quality reproduction.

The filtered output method is used, to protect the speaker windings from the possibly injurious effect of passing direct current through them. Only the audible frequencies pass through the fixed condenser connected to jack, while the direct current flows through the choke coil.

The noise level is quite low in the Antennaless Receiver, and the selectivity is

high indeed, thus reducing very considerably the number and intensity of whistles usually experienced on account of the wave of one station beating against that of another.

Nor is the distance-getting, faculty diminished because of the absence of an outdoor or indoor aerial. It is true, indeed, that a good outdoor aerial will intercept the waves much more strongly than any other system, but the additional stage of RF is included to make up for this as much as is necessary for full satisfaction, and to afford the aerialless advantage, which is one of convenience.

Uses the Ground Wave

Some say the tone quality is better on the type of receiver represented by the Antennaless. Certain it is that with the input softened, the noise level lowered and extraneous noises thus kept at minimum, the volume is achieved largely through the abundance of power in the audio channel. The situation is something like that present where a loop is used, since the advantages are of the same caliber. In the present instance, however, instead of using the magnetic component of the broadcast wave we use the capacity or electro-static component, yet only as to the ground wave.

It is well known that the ground wave is far more penetrating than the sky wave of the electro-static system of pick-up, hence we are safe in assuming there is no loss of distance-getting power.

The design, however, must be utilized in toto, since merely a pair of audio stages scarcely would afford insufficient volume, and one fewer stage of RF would give only fair volume. It must be realized that radio frequency amplification is a volume increaser, besides a radio amplifier. Full, rich tone, of sufficient volume to satisfy almost anyone, is obtainable, and the method to follow is the one shown schematically in Fig. 1.

Suitable For Eliminator

The circuit as shown is adaptable to B battery eliminator. The detector tube will not self-oscillate, because the plate is connected through the primary of the first Truphonic coupler, TR1, to A plus. Hence no B voltage whatsoever is used on the detector tube, the plate potential be-

Circuit Design is Adaptable to B Battery Eliminator and May be Operated From a Maximum of 135 Plate Volts, Although Even 90 Will Work Well—Filtered Audio Output Is Used

ing about 5 volts positive, due to connection to A plus. The applied plate voltage is equal to the difference between the negative filament and the positive A. As the rheostat drops one volt, in other words, the filament voltage is 5, the plate voltage is 5 volts positive. This is enough for good detector action.

The maximum B plus connection is the only B lead that is brought to the set. It may be 135 to 90. The voltage is cut down from that maximum to radio frequency plate values by the 200-ohm variable resistor, R2. This should be suitably bypassed. C9, which is .001 mfd., serves that purpose. For R2 a potentiometer may be used, only it is connected in rheostat fashion. One post of the potentiometer is not used, but only the centerpost and one of the side posts.

The Ground Lead

For best results a ground to the cold water pipe or to a copper plate buried 10 feet in moist earth is advisable. A long lead from actual ground or pipe to the set is in no way objectionable. A connection to a radiator or hot air vent will not do, as this type of ground never is anything better than a poor or fair makeshift.

Good coils are necessary in the receiver. Those used in the laboratory were Benjamin.

The layout of the parts is special and will be discussed and illustrated next week. The placement of the coils and the location of the sockets are important in their effect on self-oscillation and its

(Concluded on page 31)

RADIO NEWS RADIO WORLD GIVE BST-5 CERTIFICATE OF MERIT

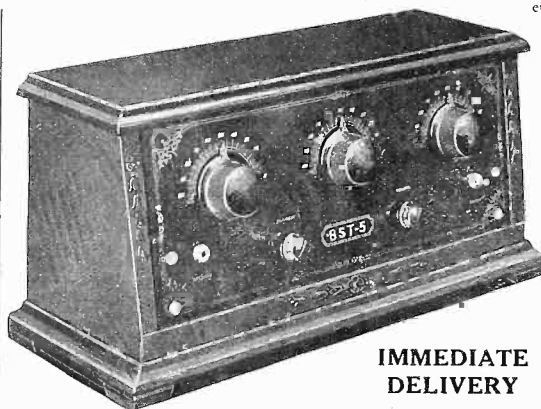
A \$75 Set Direct from Factory at \$40

I received my B. S. T. radio set two weeks ago and I am very well pleased with it.

I had the set working in fifteen minutes and at the end of two hours and a half I had twenty-nine stations logged. The set brings in new stations almost every night.

The cabinet is very well constructed and the people that have seen it say that it is a very beautiful set.

G. C. PARRISH, Dallas, Oregon.



**IMMEDIATE
DELIVERY**

New model cabinet, Du Pont Duco finish; base 21" long by 8" wide, height 9 1/2", top 21" by 6". Five-ply walnut veneer piano finish.

THIS highly sensitive, powerful and selective BST-5 radio receiver has all up-to-the-minute improvements. Heavy aluminum automobile type chassis, shielded against stray currents and distortion. Flexible grip, Universal type sockets, eliminating microphonic noises. Provision for battery eliminator and any power tube. Fahnestock clips on sub-panel for adjusting C battery, has voltages for power tube. Efficient on either long or short aerial, including indoor aerial. This BST-5 sets a new standard for true tone values and selectivity. This BST-5 gives greater volume than many six-tube sets and consumes less current.

GUARANTY RADIO GOODS CO.

145 West 45th Street

New York, N. Y.

RADIO WORLD Guarantees the Responsibility of This Advertiser

FILL OUT AND MAIL NOW

SUBSCRIPTION BLANK

RADIO WORLD

RADIO WORLD

145 West 45th Street, New York City
(Just East of Broadway)

Please send me RADIO WORLD for.....months, for which

please find enclosed

SUBSCRIPTION RATES:

Single Copy.....\$.15
Three Months.....1.50
Six Months.....3.00
One Year, 52 Issues.....6.00
Add \$1.00 a Year for Foreign
Postage; 50c for Canadian Post-
age.

City and State

GUARANTEE

Satisfaction or Money Back

Each receiver is tested and retested, boxed and inspected before leaving factory, and guaranteed to reach you direct in perfect condition. Workmanship throughout guaranteed the best. Assembled by experts.

Renaissance Model Console

With built-in Utah Unit Loud Speaker and commodious compartment in which there is ample room for batteries, charger, eliminators, etc.

**COMPLETE
RECEIVER
BST-5
Loud Speaker
and Console**

\$57.00

As Illustrated

\$40.

Send Check or
P. O. Money Order

Good Back Numbers of RADIO WORLD

The following illustrated articles have appeared in recent issues of RADIO WORLD:

1926:

- Mar. 6—The 1-Tube Set, by Capt. O'Rourke. The Chemistry of Batteries, by A. R. Reid.
- Mar. 13—The Non-Regenerative Browning-Drake Set (Part 1), by M. B. Sleeper. The Tectron Eliminator, by Lewis Winner.
- Mar. 20—The Super-Heterodyne, by J. E. Anderson. A 2-Tube Speaker Set, by Percy Warren. The Browning-Drake Set (Part 2), by M. B. Sleeper.
- Mar. 27—An Economical 4-Tube Set, by Edgar T. Collins. A Practical B Battery, by Capt. P. V. O'Rourke. Tectron Trouble Shooting, by Lewis Winner.
- April 3—How to Get DX, by Capt. P. V. O'Rourke. A Compact B Supply, by Lewis Winner.
- April 17—The New 1-Dial Powerline, by Capt. P. V. O'Rourke. The Action of Transformers, by Lewis Winner.
- May 1—New Multiple Tube, by Herman Bernard. The Aero All-Wave Set, by Capt. O'Rourke. Kilocycle-Meter Chart. An Analysis of Detection, by J. E. Anderson (Part 1).
- May 8—A Study of Detection, by J. E. Anderson (Part 2). To Wind a Loop on a Card-board Frame. How to Refer Resistance AF, by Theo. Kerr.
- May 15—Super-Heterodyne Results Brought Up to Maximum, by Herman Bernard. The Truth About Coil Fields, by J. E. Anderson.
- May 22—A Built-in Speaker Set, by Herbert E. Hayden. The Powerline in Operation, by Capt. P. V. O'Rourke.
- May 29—Aerials in Ground and water, by Lewis Winner. Economized Filaments, by J. E. Anderson. How to Get DX, by John F. Rider.
- June 5—Five-Tube Compact Receiver, by J. E. Anderson. A Tester for Tube Circuits, by Spencer Hood. Problems of Portables, by Hugo Gernsback.
- June 19—Selectivity's Amazing Toll, by J. E. Anderson. The Light 5-Tube Portable Set, by Herman Bernard (Part 2). The 4-Tube Rogers-Schmidt, by Wm. A. Schmidt, Jr. (Part 2).
- July 3—Set with a 1-Turn Primary, by Herman Bernard. Part 2 of the Victoreen Portables, by H. Bernard. Trouble Shooting Article for The Light 5-Tube Portable, by Herman Bernard.
- July 10—A Ruh in Single Control, by Herman Bernard. A DX Double Regenerator, by Capt. P. V. O'Rourke. A 2-Tube Dry Cell Receiver, by Samuel Schmalz.
- July 17—A Double Duty Loop Aerial, by J. E. Anderson. How to Measure Coupling, by John Rider. A 1-Control Crystal Set, by Smedley Lyons.
- July 24—Why the Super-Heterodyne Is the Best Set, by Herman Bernard. A 1-Tube Reflex Receiver, by H. A. Reed.
- July 31—What's Best in an AF Amplifier, by Herman Bernard. A 6-Tube Reversed Feedback Set, by K. B. Humphrey.
- Aug. 7—The 5-Tube Tabloid, by A. Irving Witz. The Wiring of Double Jack, by Samuel Lager.
- Aug. 14—The Improved Browning-Drake, by Herman Bernard (Part 1). Storage Batteries, by John A. White.
- Aug. 21—A New Stabilized Circuit, by E. H. Loftin and S. Y. White (Part 1). The Browning-Drake, by Herman Bernard (Part 2).
- Aug. 28—The Constant Coupling, by E. H. Loftin and S. Y. White (Part 2). The Browning-Drake, by Herman Bernard (Part 3).
- Sept. 4—The Four Rectifier Types, by K. B. Humphrey. A Simple Battery Charger, by J. E. Anderson.
- Sept. 11—The Beacon (3-tubes), by James H. Carroll. The 1927 Model Victoreen, by Herman Bernard.
- Sept. 18—The 1927 Victoreen, by Arthur H. Lynch. Eliminator in a Cash Box, by Paul R. Fernald.
- Sept. 25—The Lynch Lamp Socket Amplifier, by Arthur H. Lynch. Wiring up the Victoreen, by Herman Bernard.
- Oct. 2—The Victoreen (Continued), by Herman Bernard. New Equamatic System, by Capt. P. V. O'Rourke.
- Oct. 9—A Practical "A" Eliminator, by Arthur H. Lynch. Building the Equamatic, by Capt. P. V. O'Rourke.
- Oct. 16—The Bernard, by Herman Bernard. How to Box an "A" Supply, by Herbert E. Hayden.
- Oct. 23—The 5-tube P. C. Samson, by Capt. P. V. O'Rourke. Getting DX on the Bernard, by Lewis Winner.
- Oct. 30—The Singletrot Receiver, by Herbert E. Hayden. How to Get Rid of Squeals, by Herman Bernard.
- Nov. 6—Reduction of Interference, by A. N. Goldsmith. Variations of Impedances, by J. E. Anderson.
- Nov. 13—The 4-tube Hi-Power Set, by Herbert E. Hayden. A Study of Eliminators, by Herman Bernard.

Any copy, 15c. Any 7 copies, \$1.00. All these 33 copies for \$4.50, or start subscription with any issue. RADIO WORLD, 145 West 45th Street, New York City.

The Antennaless Receiver

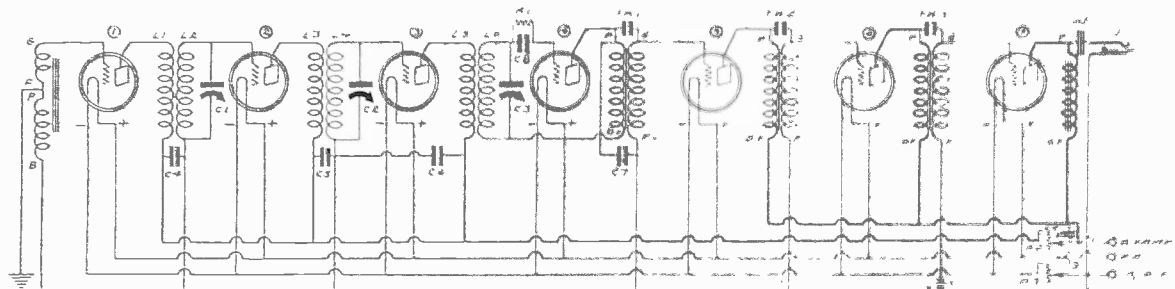


FIG. 1

In the Antennaless Receiver, the circuit diagram of which is shown schematically, an iron core radio frequency transformer of the untuned type is used in the first stage, followed by three tuned stages, one of which is the detector input. The coils and variable condensers are Benjamin. The audio channel is composed of three stages of Truphonic coupling, TR1, TR2 and TR3. The commercial audio units are complete and include encased coupling condensers.

Ground Connection Is Made to the Input and, With Suitable Audio Amplification, Affords All Sufficient Volume, Excellent Selectivity And Distance—Ground Wave Is Noted For Its Penetrating Quality

By Dr. Louis B. Blan

AS a great number of persons desire to do away with an outdoor or indoor aerial, a seven-tube receiver was designed that will meet these conditions. All one needs is a good ground connection, and this is brought to a joined pair of posts of a fixed or untuned, radio frequency transformer that has an iron core. In many instances even the ground may be supplanted successfully with a lamp socket antenna.

The untuned stage is followed by three tuned stages. The set is balanced against self-oscillation by reduction of the plate voltage, hence plate current, to the highest value consistent with avoidance of squeals. The negative bias on the radio frequency tube grids is automatic and is equal to the voltage drop in the rheostat R3, being about one volt.

Volume High, Tone Fine

In the audio channel three stages of Truphonic coupling are used, as these bring up the volume to the desired high level and afford excellent quality reproduction.

The filtered output method is used, to protect the speaker windings from the possibly injurious effect of passing direct current through them. Only the audible frequencies pass through the fixed condenser connected to jack, while the direct current flows through the choke coil.

The noise level is quite low in the Antennaless Receiver, and the selectivity is

high indeed, thus reducing very considerably the number and intensity of whistles usually experienced on account of the wave of one station beating against that of another.

Nor is the distance-getting, faculty diminished because of the absence of an outdoor or indoor aerial. It is true, indeed, that a good outdoor aerial will intercept the waves much more strongly than any other system, but the additional stage of RF is included to make up for this as much as is necessary for full satisfaction, and to afford the aerialless advantage, which is one of convenience.

Uses the Ground Wave

Some say the tone quality is better on the type of receiver represented by the Antennaless. Certain it is that with the input softened, the noise level lowered and extraneous noises thus kept at minimum, the volume is achieved largely through the abundance of power in the audio channel. The situation is something like that present where a loop is used, since the advantages are of the same caliber. In the present instance, however, instead of using the magnetic component of the broadcast wave we use the capacity or electro-static component, yet only as to the ground wave.

It is well known that the ground wave is far more penetrating than the sky wave of the electro-static system of pick-up, hence we are safe in assuming there is no loss of distance-getting power.

The design, however, must be utilized in toto, since merely a pair of audio stages scarcely would afford insufficient volume, and one fewer stage of RF would give only fair volume. It must be realized that radio frequency amplification is a volume increaser, besides a radio amplifier. Full, rich tone, of sufficient volume to satisfy almost anyone, is obtainable, and the method to follow is the one shown schematically in Fig. 1.

Suitable For Eliminator

The circuit as shown is adaptable to B battery eliminator. The detector tube will not self-oscillate, because the plate is connected through the primary of the first Truphonic coupler, TR1, to A plus. Hence no B voltage whatsoever is used on the detector tube, the plate potential be-

Circuit Design is Adaptable to B Battery Eliminator and May be Operated From a Maximum of 135 Plate Volts, Although Even 90 Will Work Well—Filtered Audio Output Is Used

ing about 5 volts positive, due to connection to A plus. The applied plate voltage is equal to the difference between the negative filament and the positive A. As the rheostat drops one volt, in other words, the filament voltage is 5, the plate voltage is 5 volts positive. This is enough for good detector action.

The maximum B plus connection is the only B lead that is brought to the set. It may be 135 to 90. The voltage is cut down from that maximum to radio frequency plate values by the 200-ohm variable resistor, R2. This should be suitably bypassed. C9, which is .001 mfd., serves that purpose. For R2 a potentiometer may be used, only it is connected in rheostat fashion. One post of the potentiometer is not used, but only the centerpost and one of the side posts.

The Ground Lead

For best results a ground to the cold water pipe or to a copper plate buried 10 feet in moist earth is advisable. A long lead from actual ground or pipe to the set is in no way objectionable. A connection to a radiator or hot air vent will not do, as this type of ground never is anything better than a poor or fair makeshift.

Good coils are necessary in the receiver. Those used in the laboratory were Benjamin.

The layout of the parts is special and will be discussed and illustrated next week. The placement of the coils and the location of the sockets are important in their effect on self-oscillation and its

(Concluded on page 31)

RADIO NEWS RADIO WORLD GIVE BST-5 CERTIFICATE OF MERIT

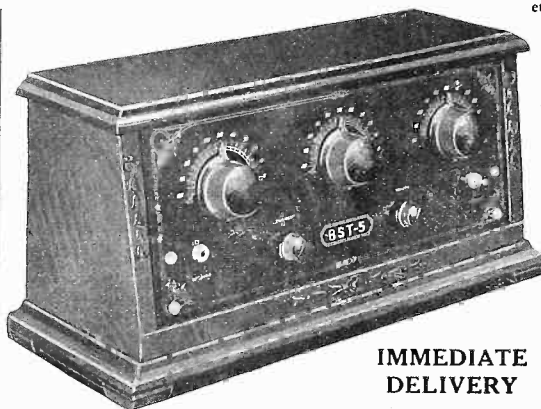
A \$75 Set Direct from Factory at \$40

I received my B. S. T. radio set two weeks ago and I am very well pleased with it.

I had the set working in fifteen minutes and at the end of two hours and a half I had twenty-nine stations logged. The set brings in new stations almost every night.

The cabinet is very well constructed and the people that have seen it say that it is a very beautiful set.

G. C. PARRISH, Dallas, Oregon.



New model cabinet, Du Pont Duco finish; base 21" long by 8" wide, height 9½", top 21" by 6". Five-ply walnut veneer piano finish.

THIS highly sensitive, powerful and selective BST-5 radio receiver has all up-to-the-minute improvements. Heavy aluminum automobile type chassis, shielded against stray currents and distortion. Flexible grip, Universal type sockets, eliminating microphonic noises. Has provision for battery eliminator and any power tube. Fahnestock clips on sub-panel for adjusting C battery, has voltages for power tube. Efficient on either long or short aerial, including indoor aerial. This BST-5 sets a new standard for true tone values and selectivity. This BST-5 gives greater volume than many six-tube sets and consumes less current.

GUARANTY RADIO GOODS CO.

145 West 45th Street

New York, N. Y.

RADIO WORLD Guarantees the Responsibility of This Advertiser

GUARANTEE

Satisfaction or Money Back

Each receiver is tested and retested, boxed and inspected before leaving factory, and guaranteed to reach you direct in perfect condition. Workmanship throughout guaranteed the best. Assembled, by experts.

Renaissance Model Console

With built-in Utah Unit Loud Speaker and commodious compartment in which there is ample room for batteries, charger, eliminators, etc.

**COMPLETE RECEIVER
BST-5
Loud Speaker
and Console**

\$57.00

As Illustrated

\$40.

Send Check or
P. O. Money Order

**IMMEDIATE
DELIVERY**

FILL OUT AND MAIL NOW

SUBSCRIPTION BLANK

RADIO WORLD

RADIO WORLD

145 West 45th Street, New York City
(Just East of Broadway)

Please send me RADIO WORLD for.....months, for which

please find enclosed

SUBSCRIPTION RATES:

Single Copy.....\$.15
Three Months.....1.50
Six Months.....3.00
One Year, 52 Issues.....6.00
Add \$1.00 a Year for Foreign
Postage; 50c for Canadian Post-
age.

City and State

Good Back Numbers of RADIO WORLD

The following illustrated articles have appeared in recent issues of RADIO WORLD:

1926:

- Mar. 6—The 1-Tube Set, by Capt. O'Rourke. The Chemistry of Batteries, by A. R. Reid.
- Mar. 13—The Non-Regenerative Browning-Drake Set (Part 1), by M. B. Sleeper. The Electron Eliminator, by Lewis Winner.
- Mar. 20—The Super-Heterodyne, by J. E. Anderson. A 2-Tube Speaker Set, by Percy Warren. The Browning-Drake Set (Part 2), by M. B. Sleeper.
- Mar. 27—An Economical 4-Tube Set, by Edgar T. Collins. A Practical B Battery, by Capt. P. V. O'Rourke. Tectron Trouble Shooting, by Lewis Winner.
- April 3—How to Get DX, by Capt. P. V. O'Rourke. A Compact B Supply, by Lewis Winner.
- April 17—The New 1-Dial Powertone, by Capt. P. V. O'Rourke. The Action of Transformers, by Lewis Winner.
- May 1—New Multiple Tube, by Herman Bernard. The Aero All-Wave Set, by Capt. O'Rourke. Kilocycle-Meter Chart. An Analysis of Detection, by J. E. Anderson (Part 1).
- May 8—A Study of Detection, by J. E. Anderson (Part 2). To Wind a Loop on a Card-board Frame. How to Reflex Resistance AF, by Theo. Kerr.
- May 15—Super-Heterodyne Results Brought Up to Maximum, by Herman Bernard. The Truth About Coil Fields, by J. E. Anderson.
- May 22—A Built-in Speaker Set, by Herbert E. Hayden. The Powertone in Operation, by Capt. P. V. O'Rourke.
- May 29—Aerials in Ground and water, by Lewis Winner. Economized Filaments, by J. E. Anderson. How to Get DX, by John F. Ruder.
- June 5—Five-Tube Compact Receiver, by J. E. Anderson. A Tester for Tube Circuits, by Spencer Hood. Problems of Portables, by Hugo Gernsback.
- June 19—Selectivity's Amazing Toll, by J. E. Anderson. The Light 5-Tube Portable Set, by Herman Bernard (Part 2). The 4-Tube Rogers-Schmidt, by Wm. A. Schmidt, Jr. (Part 2).
- July 3—Set with a 1-Turn Primary, by Herman Bernard. Part 2 of the Victoreen Portable, by H. Bernard. Trouble Shooting Article for The Light 5-Tube Portable, by J. E. Anderson.
- July 10—A Rub in Single Control, by Herman Bernard. A DX Double Regenerator, by Capt. P. V. O'Rourke. A 2-Tube Dry Cell Receiver, by Samuel Schmalz.
- July 17—A Double Duty Loop Aerial, by J. E. Anderson. How to Measure Coupling, by John Rider. A 1-Control Crystal Set, by Smedley Lyons.
- July 24—Why the Super-Heterodyne Is the Best Set, by Herman Bernard. A 1-Tube Reflex Receiver, by H. A. Reed.
- July 31—What's Best in an AF Amplifier, by Herman Bernard. A 6-Tube Reversed Feedback Set, by K. B. Humphrey.
- Aug. 7—The 5-Tube Tabloid, by A. Irving Witz. The Wiring of Double Jack, by Samuel Lager.
- Aug. 14—The Improved Browning-Drake, by Herman Bernard (Part 1). Storage Batteries, by John A. White.
- Aug. 21—A New Stabilized Circuit, by E. H. Loftin and S. Y. White (Part 1). The Browning-Drake, by Herman Bernard (Part 2).
- Aug. 28—The Constant Coupling, by E. H. Loftin and S. Y. White (Part 2). The Browning-Drake, by Herman Bernard (Part 3).
- Sept. 4—The Four Rectifier Types, by K. B. Humphrey. A Simple Battery Charger, by J. E. Anderson.
- Sept. 11—The Beacon (3-tubes), by James H. Carroll. The 1927 Model Victoreen, by Herman Bernard.
- Sept. 18—The 1927 Victoreen, by Arthur H. Lynch. Eliminator in a Cash Box, by Paul R. Fernald.
- Sept. 25—The Lynch Lamp Socket Amplifier, by Arthur H. Lynch. Wiring up the Victoreen, by Herman Bernard.
- Oct. 2—The Victoreen (Continued), by Herman Bernard. New Equamatic System, by Capt. P. V. O'Rourke.
- Oct. 9—A Practical "A" Eliminator, by Arthur H. Lynch. Building the Equamatic, by Capt. P. V. O'Rourke.
- Oct. 16—The Bernard, by Herman Bernard. How to Box an "A" Supply, by Herbert E. Hayden.
- Oct. 23—The 5-tube P. C. Samson, by Capt. P. V. O'Rourke. Getting DX on the Bernard, by Lewis Winner.
- Oct. 30—The Singletrot Receiver, by Herbert E. Hayden. How to Get Rid of Squalls, by Herman Bernard.
- Nov. 6—Reduction of Interference, by A. N. Goldsmith. Variations of Impedances, by J. E. Anderson.
- Nov. 13—The 4-tube Hi-Power Set, by Herbert E. Hayden. A Study of Eliminators, by Herman Bernard.

Any copy, 15c. Any 7 copies, \$1.00. All these 33 copies for \$4.50, or start subscription with any issue. RADIO WORLD, 145 West 45th Street, New York City.

The Antennaless Receiver

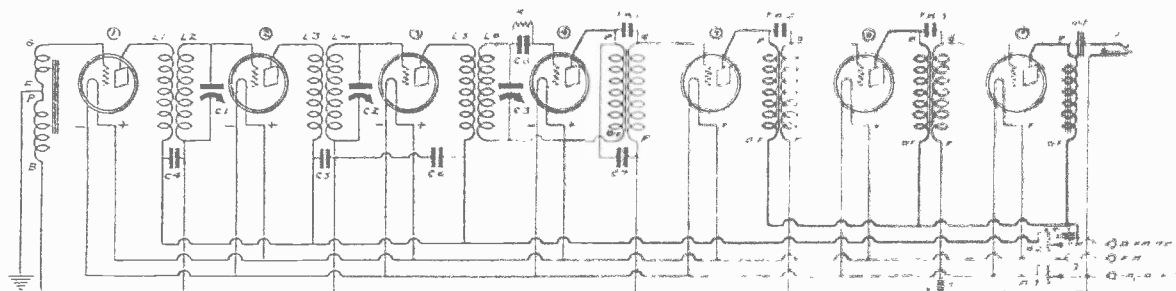


FIG. 1

In the Antennaless Receiver, the circuit diagram of which is shown schematically, an iron core radio frequency transformer of the untuned type is used in the first stage, followed by three tuned stages, one of which is the detector input. The coils and variable condensers are Benjamin. The audio channel is composed of three stages of Truphonic coupling, TR1, TR2 and TR3. The commercial audio units are complete and include encased coupling condensers.

Ground Connection Is Made to the Input and, With Suitable Audio Amplification, Affords All Sufficient Volume, Excellent Selectivity And Distance—Ground Wave Is Noted For Its Penetrating Quality

By Dr. Louis B. Blan

AS a great number of persons desire to do away with an outdoor or indoor aerial, a seven-tube receiver was designed that will meet these conditions. All one needs is a good ground connection, and this is brought to a joined pair of posts of a fixed or untuned, radio frequency transformer that has an iron core. In many instances even the ground may be supplanted successfully with a lamp socket antenna.

The untuned stage is followed by three tuned stages. The set is balanced against self-oscillation by reduction of the plate voltage, hence plate current, to the highest value consistent with avoidance of squeals. The negative bias on the radio frequency tube grids is automatic and is equal to the voltage drop in the rheostat R3, being about one volt.

Volume High, Tone Fine

In the audio channel three stages of Truphonic coupling are used, as these bring up the volume to the desired high level and afford excellent quality reproduction.

The filtered output method is used, to protect the speaker windings from the possibly injurious effect of passing direct current through them. Only the audible frequencies pass through the fixed condenser connected to jack, while the direct current flows through the choke coil.

The noise level is quite low in the Antennaless Receiver, and the selectivity is

high indeed, thus reducing very considerably the number and intensity of whistles, usually experienced on account of the wave of one station bearing against that of another.

Nor is the distance-getting, faculty diminished because of the absence of an outdoor or indoor aerial. It is true, indeed, that a good outdoor aerial will intercept the waves much more strongly than any other system, but the additional stage of RF is included to make up for this as much as is necessary for full satisfaction, and to afford the aerialless advantage, which is one of convenience.

Uses the Ground Wave

Some say the tone quality is better on the type of receiver represented by the Antennaless. Certain it is that with the input softened, the noise level lowered and extraneous noises thus kept at minimum, the volume is achieved largely through the abundance of power in the audio channel. The situation is something like that present where a loop is used, since the advantages are of the same caliber. In the present instance, however, instead of using the magnetic component of the broadcast wave we use the capacity or electro-static component, yet only as to the ground wave.

It is well known that the ground wave is far more penetrating than the sky wave of the electro-static system of pick up, hence we are safe in assuming there is no loss of distance-getting power.

The design, however, must be utilized in toto, since merely a pair of audio stages scarcely would afford sufficient volume, and one fewer stage of RF would give only fair volume. It must be realized that radio frequency amplification is a volume increaser, besides a radio amplifier. Full, rich tone, of sufficient volume to satisfy almost anyone, is obtainable, and the method to follow is the one shown schematically in Fig. 1.

Suitable For Eliminator

The circuit as shown is adaptable to B battery eliminator. The detector tube will not self-oscillate, because the plate is connected through the primary of the first Truphonic coupler, TR1, to A plus. Hence no B voltage whatsoever is used on the detector tube, the plate potential be-

Circuit Design is Adaptable to B Battery Eliminator and May be Operated From a Maximum of 135 Plate Volts, Although Even 90 Will Work Well—Filtered Audio Output Is Used

ing about 5 volts positive, due to connection to A plus. The applied plate voltage is equal to the difference between the negative filament and the positive A. As the rheostat drops one volt, in other words, the filament voltage is 5, the plate voltage is 5 volts positive. This is enough for good detector action.

The maximum B plus connection is the only B lead that is brought to the set. It may be 135 to 90. The voltage is cut down from that maximum to radio frequency plate values by the 200-ohm variable resistor, R2. This should be suitably bypassed. C9, which is .001 mfd., serves that purpose. For R2 a potentiometer may be used, only it is connected in rheostat fashion. One post of the potentiometer is not used, but only the centerpost and one of the side posts.

The Ground Lead

For best results a ground to the cold water pipe or to a copper plate buried 10 feet in moist earth is advisable. A long lead from actual ground or pipe to the set is in no way objectionable. A connection to a radiator or hot air vent will not do, as this type of ground never is anything better than a poor or fair makeshift.

Good coils are necessary in the receiver. Those used in the laboratory were Benjamin.

The layout of the parts is special and will be discussed and illustrated next week. The placement of the coils and the location of the sockets are important in their effect on self-oscillation and its

(Concluded on page 31)

SIR OLIVER LODGE GIVES N CIRCUIT

**Much - Rated Non - Radiating Receiver, Comprising
Single Stage, Not Selective Enough for American
Needs—Universal Adoption Asked**

The N circuit of Sir Oliver Lodge, the non-radiating design that obtained much publicity without disclosure of the hookup, was made public in London recently. Fig. 1 shows the hookup. The kind words Sir Oliver said about it would not apply wholly in the United States, as the circuit is not sufficiently selective.

Sir Oliver said:

"In designing the receiver which has now become known as the N circuit my object was first to provide a wireless set that would not oscillate or cause interference with neighboring sets (and this is very necessary if we are all to enjoy the broadcasting, just as traffic control on the roads is necessary if we are to

have safety); secondly, to provide a set which would be perfectly simple to operate and yet would receive programs from the local stations as well as the distant stations.

"If the N circuit were universally adopted there would be an end to the oscillation nuisance."

The fundamental principle of the circuit is the single connection between the antenna and detector tube. It is a closed oscillating circuit.

Sir Oliver maintains that for good quality of reproduction there should not be more than one tuned circuit, as, if two tuned circuits be employed, there is a great likelihood distortion owing to heterodyning between the circuits.

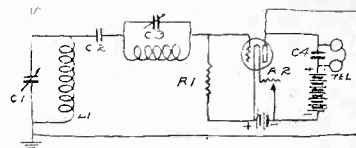


FIG. 1.

The N circuit, C1 would have to be at least .001 mfd. for American conditions, L1 being about 35 turns on 3 inch diameter, C3 may be .0005 and L2 be 50 turns or more on 3 inches. The grid leak is 3 meg. C2 is .00025 mfd. and C4 is .002 mfd.

News Broadcast, U. S. to Arctic

News, somewhat delayed but still news, was broadcast by KYW, Chicago; KFKX, Hastings, Nebr.; WBZ, Springfield, Mass., and KDKA, Pittsburgh, to the Arctic. The result of the Dempsey-Tunney fight, though a month had elapsed, was absolutely fresh to the Arctic denizens.

No mail or news has entered the Arctic region since the freeze-up early in the Fall, so KYW informed residents of trading posts and detachments of the Royal Canadian Mounted Police that destructive hurricanes have visited Florida and the West Indies, and broadcast various other happenings.

Care and Patience Aid In Trouble-Shooting

With the aid of a systematic check up system, servicing a home made or manufactured receiver is a very simple process. Patience is a very important essentiality, though.

It is taken for granted that the receivers had previously worked satisfactorily and suddenly ceased to give satisfaction either as to poor volume, quality, or distance. Of course, if the receiver is of the home made type, and didn't work upon completion, the wiring should be checked back, first. This is the only step that differs from the completed sets although if a wiring diagram of the factory made set is at hand, a check up, in case of a broken lead, will ease matters.

Materials Required

A pair of phones, a 1½ volt dry cell battery, flexible wires about 7 inches long with attached lugs, a hydrometer for storage A battery, a high reading voltmeter, high resistance for B eliminator and low resistance for battery type B and an exact duplicate number of tubes used in the set are the only material that are necessary for testing. Pliers, screwdrivers, soldering iron, etc., should also be at hand. The following check up should be followed:

The antenna and ground or loop, should be removed from the respective posts. Connect up a pair of phones, so that they may be connected to the output of the set. Listen in. If you hear noises, then you may be sure that the trouble is in the set. If noise is absent, then the trouble lies in the collector. Check up on the continuity of the leadin wire in the house, loosened bolts on the ground clamp, loop, lightning arrester, etc. Probably the leadin wire has become partially severed at the window sash, or on the roof, where the leadin drop is made, and making poor contact. This can be tested with the phones and battery, which

are connected in series, so that you have a lead from the battery and a lead from the phone. A small piece of the insulation should be scraped off on each side of the supposed places where the break might occur and the phone and battery lead attached. A click will indicate a complete circuit. The same method is used in finding the broken connections in the ground. In the loop, just shunt the terminals with the phone and battery leads. Be sure that no violet ray, power line, etc., has been recently installed near or in the house. Loose contacts on the transformers resistor mounting, choke coils, jacks, terminals of the socket, legs of the tube elements; poor contact on the rotor plates in the revolving holder, touching of plates at several places; broken tinsel in the flexible leads of coils, condensers or phone cords; poor contact on rheostats between leak metal points and holder, are frequent causes of internal noises. The trouble may be also in the A, B or C supply. The batteries may be checked up for noise by placing the phones across the plus and minus posts and listening. If eliminators are used, by substituting dry batteries, or by placing the eliminators far away from the set, this can be cured. The trouble might lay in the battery leads. That is, stranded wire is used in most lead wire or cables and it is possible that one of the wires has broken. This trouble resembles that found in all stranded wire, such as used in the flexible wire on coils, condensers, phones, etc. If the trouble is in the tubes, then try different tubes, or change them around. Whether testing for noise or any other trouble, the same proceedings should be followed. Test the transformer windings, resistors or choke winding for continuity. Test all coils, condensers, and resistances for complete circuits.

When you test the condensers, disconnect a lead from one terminal, so that

you will not hear a click due to a complete circuit and be misled to think that the condenser is shorted. Also don't test the condenser immediately after signals have been received, since a charge will have accumulated and again you will hear a click, without an actual short existing. Poor contacts on the plate prongs, usually give a great deal of trouble.

In a great many receivers, ballast resistors are used. The wrong carrying capacity type are many times installed, with the result that in a very short while, a certain tube will not light or the filament of the tube will not be given its proper voltage. In either case, a sudden drop in signal strength will be noticed. The resistance wire in the rheostats should be tested, also.

The springs in jacks, after some use, are pushed up and do not make good contact. In plugs, the sleeve becomes worn and poor contact again results. Even a filament switch can cause trouble. That is, a poor cutoff will drain the battery. You will then suddenly notice that the A battery (storage) is being rapidly run down.

Clean all dust out of variable condenser plates, tight wiring places, etc.

Honolulu Hears Washington and Indo-China Code

Radio signals from Saigon, Indo-China, and Washington, D. C., are being received regularly at Honolulu—a distance of 6,000 miles and 5,000 miles, respectively—according to a radio message announced by E. Lester Jones, director of the Coast and Geodetic Survey, from E. J. Brown, observer in charge of the Coast Survey's station at Honolulu.

This reception was made in connection with the longitude measurements which now are being made by means of time signals flashed by radio between stations at Annapolis, Washington, Honolulu, Saigon, Bordeaux, Issy, and the Eiffel Tower, in Paris.

HOW TO RECTIFY B ELIMINATORS

**You've Heard Much About the Eliminator Rectifying
The AC, But Here Are Some Trouble-Shooting
Data For the Unit**

With the growing use of B eliminators, the radio enthusiast must now add to his stock of knowledge at least a practical understanding of rectifiers, filter circuits and controls.

A B eliminator must be properly designed and constructed if it is to give satisfactory service, especially over a considerable period of time. A really good eliminator is costly, for it incorporates a powerful transformer, equally husky choke coils, liberal condensers, and satisfactory resistances. As with everything else, one gets precisely what one pays for in buying a B eliminator; and trouble starts, of course, with the purchase or the construction of an inferior grade of eliminator. Again, B eliminators are now made in the standard and the heavy-duty models. The standard proves quite satisfactory for the usual run of receivers. The heavy-duty model is intended for receivers employing the largest power tubes. It is unfair, of course, to expect heavy-duty service from a small eliminator.

Use Only Best Parts

For the most part, B eliminators are no longer an experiment. Most offerings are licensed under the Raytheon, the Rectron or the chemical cell rectifier patents, and the buyer is assured of a satisfactory job.

In building a home-made B eliminator, none but the best components should be employed. It is good practice to buy a kit of parts, rather than scattered units, in order to have the benefit of skilled engineering and research. Here again it is well to remember that good products cost more money but insure lasting satisfaction.

Any make of good B eliminator should operate the usual receiving set without introducing extraneous noises. However, if a hum is detected in the reception, it may be due to mechanical vibration from the B eliminator or to electromagnetic induction. In either event, the B eliminator should be placed at some distance from the receiver.

On a Hunt For the Trouble

Should the radio set suddenly cease to function when using a B eliminator, and the filaments of the receiver tubes remain lighted, the trouble is most likely in the B eliminator. If a filament tube rectifier is employed, such as the Rectron, the filament should be examined. If it is still glowing, showing that it is intact, the trouble may be elsewhere.

The next likely source of trouble may be one of the filtering condensers breaking down. Each filtering condenser should be tested out with an earphone and dry cell, connected in series, with the open leads placed on the condenser. One click should be heard when the circuit is completed through the condenser, and the successive clicks of the same condenser should be barely audible, if heard at all. Contrarywise, if each click is persistently loud, the condenser may be considered defective, and should be replaced by a perfect condenser.

Watch For Broken Leak

If the radio rendition gradually fades even over a period of days and weeks, the trouble may be due to a defective rectifying element, whether it be a tube or chemical cell.

There is always the possibility of a broken connection, hence the wiring of the B eliminator should be carefully examined. The terminals and the external wiring should also be examined for loose or broken connections.

Sometimes a B eliminator gives rise to noisy reception which, at first, may be blamed on static. However, if the noise persists even when the receiver is detuned, it is proof that the trouble is with the receiver or its power plant, and not with the atmosphere. Sometimes the cause may be traced to loose or corroded connections on the storage battery, which, while not sufficient to show up in the brightly lighted filaments, will nevertheless cause persistent noise. Again, it may be a loose wire in the connecting leads.

When Signals Grow Weak

But as likely as not the noises are due to faulty resistances, especially those of the variable kind. Variable resistances of insufficient current-carrying capacity soon become noisy and even totally inoperative after some length of everyday service, yet the radio enthusiast, in his search for the trouble, will take the satisfactory performance of the variable resistance controls for granted.

It is no uncommon experience to have a radio receiver suddenly or gradually stop working for no apparent cause. Or again, the signals become weaker and weaker, even though the filament current and the B eliminator output appear satisfactory. Yet all the while the trouble may be due to the breakdown of one of the intermediate voltage control resistances, which has escaped detection.

Variable and Fixed Resistors

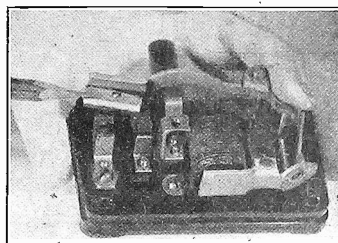
So, all in all, the variable resistances present a source of trouble in B eliminators. The resistor should be capable of handling currents as high as 200 milliamperes at the usual operating voltages, e. g., the Clarostat, without danger of baking or frying or arcing.

Some B eliminators have eliminated all variable resistances, using, instead, fixed resistances to obtain the necessary fixed voltages. Such practice, while insuring silent and positive operation, has the disadvantage of failing to provide the critical voltages required by the different circuits for maximum sensitivity, volume and tone quality. It is a fact that the plate voltage on the radio-frequency tubes is of great importance as regards the sensitivity of the receiver and the tone quality, especially in regulating reception for powerful, local signals, and weak, distant signals. The detector voltage makes all the difference between extreme sensitivity with sharp tonal rendition, or less sensitivity with a mellow reproduction. The plate voltage on the audio-frequency tubes enables the proper balance to be struck with the C battery, for distortionless reproduction.

WIOD GOOD IN NEW YORK

In the New York metropolitan district, since several of its stations have switched to higher wavelengths, reception of distant stations on 210 to 260 meters is now reported to be excellent after nine o'clock at night. WIOD in Florida is coming through with particularly good volume.

CIRCUIT BREAKER



(Hayden)

A SMALL circuit breaker for use with B eliminators. When the button is depressed the metal strip closes the circuit by resting against the two metal contacts. A little catch secures it. When a line surge in excess of three amperes floats in, the magnet winding becomes energized, and the catch is snapped open, thus opening and protecting the circuit. Conditions are restored by again depressing the black button.

How South Africa Got Fight Result

How a Johannesburg, South Africa, newspaper caught its final edition with the result of the Dempsey-Tunney fight, through the medium of 2XAF, the 32.79 meter transmitter of the General Electric Company, is recounted in the Sept. 25 issue of the Rand "Daily Mail." To meet the necessary train the "Daily Mail's" press time limit is 4:30 a. m. At 4:22 the announcer at Philadelphia announced Tunney the winner and while the cheers were still echoing in the stadium the presses in Johannesburg began to grind out the result. Reuter's cable decision arrived at 4:48, just twenty-six minutes after 2XAF had carried the message.

In its story headed "New Speed Record," the Rand "Daily Mail" stated.

"A new speed record in news collection and presentation was created in South Africa in the early hours of yesterday morning, when within twelve minutes of the referee's announcing of the ringside in Philadelphia, U. S. A., that Gene Tunney was the new world's heavyweight boxing champion, the great presses of the Rand "Daily Mail" in Johannesburg were printing papers containing the news."

The news story then explains that the American time is seven hours behind the South African time, that 9:30 p. m. in Philadelphia means 4:30 a. m. in Johannesburg, and the news has 10,000 miles to travel. A "Daily Mail" representative was detailed to attend a local amateur and get the fight direct from 2XAF of Schenectady, N. Y., and a second man was sent to listen on a crystal set to JB, the South African station which was re-broadcasting 2XAF.

80 Fans Per 1,000 Is Sweden's Tally

WASHINGTON

There are around 80 fans to every 1,000 population in Sweden, according to reports to the Department of Commerce. At the end of July this year, there were 203,833 licensed radio receivers in the entire country. The city of Djursholm had the largest number with 99.5 licenses per 1,000 population. Malmo had 98 per 1,000.

SPEAKERS IN SERIES GIVE BETTER TONE

Series Connection Should Be Utilized, to Bring Impedance Nearer to That of the Tube—How to Match Speakers Thus Joined

It has long been recognized that no single loud speaker of commercial type gives perfect reproduction over the entire musical scale, but tends to amplify some tones more than others. The wise radio fan in search of greatest fidelity of reproduction, therefore, will use two speakers and depend upon their different characteristics to even up amplification throughout the entire tone range. Several of the highest priced radio receivers now use a combination such as this with excellent results.

Set owners who have tried the combination of a good cone and a good horn type speaker, or two horn type speakers with different characteristics, report a marked improvement in tone, so much so in fact, that a single speaker may sound thin and lack timber by comparison.

Matching Speakers

The home experimenter frequently has difficulty in matching the two speakers used. Lacking the facilities of the manufacturer who chooses equipment for this particular purpose, he finds one speaker so much softer than the other one that it cannot be heard at all when both are series connected. This difficulty can be easily corrected with the new cord type Central Modu-Plug, either by connecting one plug to each speaker so as to control the tone volume of one entirely independent of the other, or by connecting a single plug to the louder speaker.

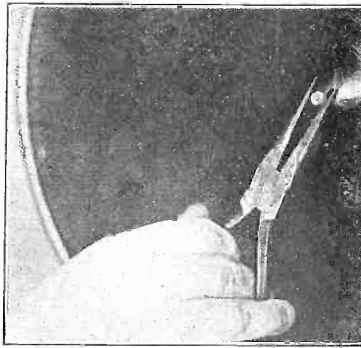
This Modu-Plug is a small device that has many handy applications where tone volume is required. It is a variable high resistance of special type in a phone plug, case and shunts the speaker in a way to provide gradual control of tone volume from a whisper to maximum. In the cord type, a phone cord replaces the customary plug connection, and for that reason this type can be used anywhere in the speaker line without the need of making up a jack connection.

Connect in Series

When using two or more speakers, always connect in series so that the current goes through one speaker and then through the other. This increases the impedance of the speaker circuit and makes for better quality than a parallel connection, where the impedance will be reduced far below that of the output tube.

To balance two speakers in series with a single Modu-Plug, first determine the louder of the two speakers. Now insert the cord of this speaker into the spring terminals in the Modu-Plug base. Attach one of the Modu-Plug cord tips to a speaker terminal of the set and the other cord tip to one of the tips of the second speaker. The other cord tip of

CURES RATTLE



(Hayden)

RATTLING in a cone sometimes is caused by the apex working loose. Place a finger on apex, and tighten the loose apex with pliers.

this speaker is then attached to the set. A small sleeve connector can be purchased at radio or electrical stores to connect the two cord tips, or in experimenting, they can be held together with a bit of copper wire.

Both speakers are now in series, with the Modu-Plug controlling the louder one. Adjusting the small knob on the plug will gradually diminish the tone volume of this speaker and slightly increase the volume of the other, therefore any desired balance is quickly obtained.

Radio Lauded by Earl of Clarendon

LONDON

"We must get it out of our heads that it is only a plaything," declares the Earl of Clarendon, new Government Chairman of the British Broadcasting Corporation, when asked about his opinion of radio.

"Radio is more than that," he contends. "It is a new factor in life. We must use it for something higher than just playing dance music, although you cannot ignore that side of it altogether."

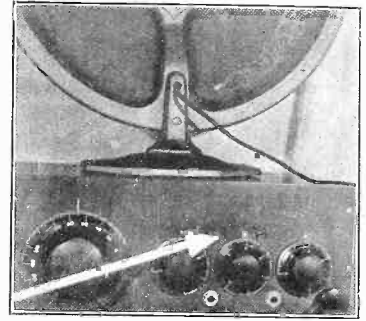
Educational features are gaining popularity in the radio programs, reports K. L. Allerdice Arnott, managing director of Freed-Eisemann Radio, Great Britain, Ltd., and the excellent programs are not only listened to nightly throughout the British Isles, but throughout the Continent.

"But, of course, the British wireless fan, trying to get America, is after a musical program," he admits. "It is hard to follow a speech at such range, on the normal wavelengths, but quite a number of reports of American reception are coming in."

DIM LIGHTS IN HOME HELP THIS PROGRAM

The feature of the Gondoliers, the new attraction at KGO, the General Electric station in Oakland, Cal., to be presented Monday evening, Dec. 6, will be a visit to the island home of a Russian hermit musician and philosopher. Native folk tunes, with brief word sketches as to their meaning, will be given by one of the members of the Gondoliers' entertainers, personifying the hermit. With the aid of dim lights in the room where the program is being heard, a weird effect can be had. This will indeed tend to give the program a more fascinating aspect. It probably would be still better, if stereopticon views were also used.

INDUCED HUM



(Hayden)

PLACING the speaker on top of set, as shown, causes a hum, as the speaker unit is right above the transformers, producing interaction.

Sun Spots Worse But DX Is Better

WASHINGTON

Government radio engineers and scientists are trying to reconcile their sun-spots theory with existing conditions. They are positive that sun spots were responsible for poor reception last Winter. It would logically follow that reception would be even worse this Winter because sun spots are worse.

They are baffled by the fact that, barring interference due to congestion of stations, reception is better than it has been for a long time. Fans all over the country are picking up small and large stations at incredibly long distances.

Washington fans are receiving Pacific Coast stations with surprising regularity, and HHK, Port Au Prince, Haiti, has been heard by many. Canadian and far Western stations are also coming in well. In striking contrast to last Winter, the Southern stations seem to be harder to get.

China Gets After Squealing Sets

WASHINGTON

Bloopers can be controlled in China if a new bill which is under consideration is adopted. One of the principal features of the bill is that radio receiving sets come within the definition of a wireless telegraph station for which a license would be required. The fee for a receiving set would be approximately \$2.50 per year.

If arrangements are made to put on such programs as to make the possession of a receiving set more valuable, the license fee could be increased.

A large proportion of the fee would go to the broadcasting companies to pay for operation of stations.

NEW STATION IN FINLAND

WASHINGTON

A powerful broadcasting station is to be constructed in Finland, according to reports received by the Department of Commerce. The station would be of 25 kilowatts power and would operate on 1,500 meters.

Fans in America who heard of it built hopes of receiving the station.

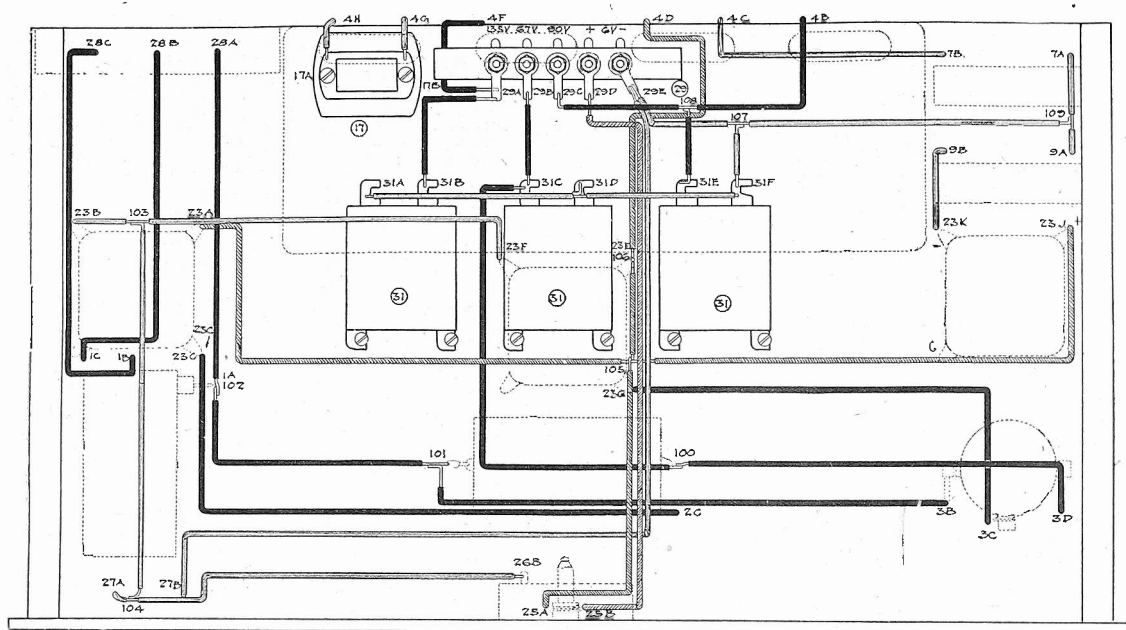


FIG. 7

EFFICIENCY DATA ON DAVEN CIRCUIT

Connections to the Two-Section Condenser Should Be Made Carefully—How to Use Various Antennas on This Hookup

So that you may be absolutely sure of getting the best out of the Daven Bass Note Circuit (described November 13 and 20) it is suggested that the following points be checked up.

The connection terminals, 19C and 19E of the 2-section condenser 19 and also 20C of condenser 20 indicate grounded frame or rotor connections. The terminals 19D, 19A and 19B of the 2-section condenser 19, and 20A and 20B of condenser 20 are the stator terminals. These connections are stressed since they differ with the terminal arrangements of variable condensers of different manufacture. Also be sure that terminal 19E is a grounded frame connection and not a stator connection as shown.

The C battery, No. 24, which is really made of two batteries connected in series so as to give from 9½ to 10 volts, should have its positive terminal No. 24A connected to 4K of the amplifier unit. No. 24B is likewise run to 4J. These terminals should not be reversed. Neither should the set be operated without the C battery. This will cause distortion and short tube life.

The antenna should not be more than 100 feet in overall length. If the receiver is operated within large metropolitan areas, or in proximity to a local broadcast station, the antenna should not exceed 50 feet in length. Using the 100-foot antenna, the connection should be made to ANT-L, while with the short antenna, the connection should be made to ANT-S. Both methods should be tried for best results. The ground wire, preferably leading to a cold water pipe is connected to the GND. post.

LIST OF PARTS

- One Daven Radio Frequency Coil No. 1.
- One Daven Radio Frequency Coil No. 2.
- One Daven Radio Frequency Coil No. 3.
- One Daven Super-Amp ifier, 3 stages.
- Three Daven Mu-20 tubes,
- One Daven Mu-6 power tube.
- One Daven 1½ Ampere ballast tube.
- One Daven 1 ampere ballast tube for other tubes.
- One Daven ¾ ampere ballast tube.
- One Daven 2 megohm Glastor grid resistor.
- One Daven No. 50 Glastor mounting.
- One Daven special type "A" condenser.
- One radio frequency choke coil.
- One Daven Compensator.
- One Daven Balancer.
- One .0005 mfd. fixed condenser.
- One .006 mfd. fixed condenser.
- One .00025 mfd. grid condenser.
- One 2 section .00035 mfd. variable condenser.
- One single section .00035 mfd. variable condenser.
- Two vernier tuning dials.
- Two —01A type tubes.
- Three UX shock proof sockets.
- One 9 to 10½ volt C battery.
- One push pull filament switch.
- One 400 ohm potentiometer.
- One 10 ohm rheostat.
- One antenna-ground terminal strip.
- One 5 terminal cable connection strip.
- One 5 conductor standard battery cable.
- Three 1 mfd. by-pass condensers.
- One 18x7x3/16" Bakelite panel.
- One 17½x9¾x5/8" wood sub-base.
- Twenty feet multi-colored buss wire.
- Miscellaneous lot of screws, solder clips.

[Parts, top down, Nos. 1 to 35]

Minstrelsy Tribute Is Paid by Paskman

The Old Time Minstrels, are popular at WGBS, New York, and WIP, Philadelphia, in the hook-up between the two Gimbel stations. Under the direction of Dailey Paskman, director of the station, the players present the type of minstrel first part made famous by Lew Dockstader, George Primrose and "Honey Boy" Evans.

The minstrel shows have been a feature of WGBS for the past sixteen months, during which time more than fifty performances have been given.

Commenting on this regular program feature, Mr. Paskman, who inaugurated and developed it, said:

"The Old Time Minstrels represents a form of American music and humor which is in danger of becoming obsolete. I feel that, inasmuch as minstrelsy is purely an American product, it is a privilege to revive this sort of entertainment so as to perpetuate the old songs, jokes, and names of the old black-face minstrel men of former days."

Dill's Aid Honored By National Club

SPOKANE, Wash.

Spokane is established as headquarters of the northwest district of the National Radio Club of Washington, D. C., through the appointment of Russell Conklin as a member of the organization's board of governors. The appointment comes as a result of Mr. Conklin's activity in radio affairs while a member of Senator C. C. Dill's office staff at the capital.

The new corporation, recently incorporated under the laws of the District of Columbia, has for its primary object the interests of broadcasting stations which will form its active voting membership, according to Mr. Conklin. Individuals and concerns who have made application for station licenses, as well as others interested in radio, are being invited to join in other classes of membership.

DAVIS DESCRIBES GROWTH OF KDKA

Started at 100 Watts, Climbed Up to 50,000—Duplicate Equipment on Hand for Emergency—Cost High, Goodwill Chief Asset

By H. P. Davis

"Father of Broadcasting," Vice-President of Westinghouse Electric & Mfg. Co.

Radio broadcasting has survived, and it has become a great institution because it was conceived and dedicated to public service. Primarily since its course of usefulness has not been directed by motives of private gain broadcasting, in the six years that have elapsed since its inception, has become an integral part of human life, in a manner without parallel in the world's history.

It is fitting that we pause in this, the crowded hour of broadcasting, to pay tribute to KDKA, the pioneer broadcasting station whose history has been said to be a record of the outstanding achievements of broadcasting.

Progress Cited

The growth of broadcasting has not been a slow progression of accomplishment but rather a rushing force crowded with pulsing achievements.

How that progress has been made is well shown in a comparison of the organization and equipment, that was KDKA in 1920, with the present broadcasting station.

The first program of KDKA was transmitted from a small 100 watt station whose operating force and program personnel consisted of four people. The outside pick-up then was unknown nor was there such a thing as a studio.

In the years that have followed, KDKA's power has been increased by stages from its original low power, to 500 watts, to 1000 watts, to 10 kilowatts, thence to 50 kilowatts and today, as the most powerful station in the world, is capable of even higher power to be used when necessary or desirable.

Often Rebuilt

By constant improvement, this many times requiring the rebuilding of the entire station, it has been maintained at the height of efficiency thus serving as a pioneer in the perfecting of radio transmitting engineering.

The imperfections of early broadcasting, when the range of tone frequencies was limited to a few octaves by the transmitting apparatus, has long since been eradicated. The modern KDKA transmits frequencies far above and below the limits of the human ear, thus assuring that every musical instrument, no matter what its scale, and every voice, is broadcast with their quality unmarred.

KDKA's outside pick-ups, the first of which was located in Calvary Episcopal Church, have been increased to 50, and there are now four separate studios, each in different sections of the Pittsburgh district.

The organization of the broadcasting station now consists of more than 60 people.

Duplicate Equipment

The broadcasting station's equipment, which includes not only the broadcast transmitter but also short wave apparatus, is in duplicate so that service may be maintained in any emergency. A record

of which KDKA may well be proud is that since its beginning it has never missed a scheduled period nor had a serious interruption.

KDKA's programs now range to every part of the world, its voice has carried messages to every continent. From the barren wastes far above the Arctic circle to the deserted bush of Australia, KDKA exerts a force for public benefit, whether it be in a message of encouragement concerning the arrival of supplies to northern post or a dance program which entertains those living on the island continent.

It Is Incomparable

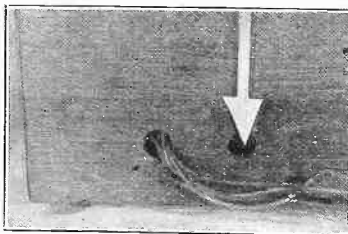
No modern agency can be compared with broadcasting in making effective contact between the business organizations and the public, provided the offering is made in the spirit of service which permeates the broadcasting world. This is clearly shown in the success of such endeavors as the Atwater Kent programs, Eveready Hours, Teaberry and Rund offerings and others.

The maintenance of such a broadcasting station as KDKA requires the expenditure of a large sum of money. In return for this there are few tangible results or manifestations of gain other than the satisfaction of giving public service.

Intense Part of Life

However, if we know that in the broadcasting of church services we are giving comfort to the shut-ins or to those unable to avail themselves otherwise of religious comfort; if we know that in broadcasting market reports, we aid the farmer in the conduct of his business; if we know that by broadcasting messages to the Far North we may assist those isolated far from civilization; if we know that in broadcasting educational courses or addresses we are aiding in the dissemination of useful information; if we know that in broadcasting to other countries, we are spreading an influence for international goodwill; if we know that our programs of entertainment are lightening the burden of humdrum life, then the mission of KDKA has been accomplished.

It is a source of gratification that the originally envisioned ideal of public service has so closely been adhered to by the broadcasting world. Founded on any other basis, the service of broadcasting which is so intensely a part of modern life, could not have endured.



(Hayden)

WHEN the leads enter the set from the rear it is well to have one hole in the cabinet for the battery leads, and another for the aerial and ground leads.

Chummy, Cheery Set Is the Demand

What most fans want in a radio receiver is not one thing but several things. In fact, they want their radio receiver to have numerous excellent qualities.

First the fan wants health, strength and lasting qualities. Not an hysterical receiver that may be quite brilliant at times, but will take a notion to whine, or squeal, or play dead when one wants to show off that receiver to visiting friends.

Of course no one wants a dull receiver. The favorite receiver must be sensitive enough and cosmopolitan enough to pick up some ideas beyond those that are common to the particular burgh in which Mr. and Mrs. DX reside. On cold winter nights one may want that receiver to enable him to fly about in the ether and call on cities all over North America.

The companionable receiver must be discriminating in character and able to stick to one subject at a time. Who in the world wants a receiver that will try to talk about two or three subjects, or try to sing two or three songs, and imitate a band; all at the same time? Selectivity must be one of the imperative characteristics.

Then one wants a receiver that can be controlled. Somebody has to be "boss" and the radio fan should be it. For the receiver to be "boss" would be running things according to somebody else's ideas, not according to the ideas of the broadcast listener.

The broadcast listener does not want a receiver that is too limited in its calling ability. He wants one that is right at home with the younger set of wavelengths, from 200 meters or younger, up to the bigger waves around 550 meters or larger.

Another needful thing in a worthy receiver is a good voice. A voice that can accommodate itself to the kinds of music it is reproducing. A voice that will do more and even remedy the defects in the music.

No one wants a receiver that will be loud-mouthed when one desires it to speak or sing softly and sweetly. In other words a receiver that includes a volume control as one of its features is something to consider.

Does anyone want a receiver in whose nature prejudice is a predominant characteristic? Isn't it better to have one that will separate short wave stations as quickly and as easily as it will separate long wave stations?

Of course, in addition to all these virtues one wants some beauty of face, of figure, or dress, or all of these. Beauty may be paint deep, or solid. What one wants in beauty is a matter of taste. One can get a receiver in a small, simple dress or one can get a receiver in a most elaborate one. However, the old saw about fine feathers does not hold in radio.

Some have selected radio receivers by accident, without any forethought or any other kind of thought. However, it is generally conceded that a receiver is of sufficient importance to think about in advance. If one intends to associate with it after the annexation, it is almost certain that some thinking should be done.

BIRD MIMIC AT WEA F

Edward Avis, the bird mimic will give a brief lecture-recital on "Songs and Calls of American and European Birds" at WEA F at 6:50 p. m. on Saturday, November 27. For his faithful reproduction of bird songs and calls as they are heard in the woods and fields, Mr. Avis is probably considered without a peer. His whistling is a natural gift possessed in a like degree by few other students of the art.

LEADIN WIRE CUT, STATION MUSIC HALTS

WRNY's Broadcast of Religious Services Interrupted as Some One Intentionally Severs Line At Remote Transmitter

Although preliminary tests on the land line, running to the Temple Emanu-El from where Jewish religious services are broadcast each week by WRNY, New York City, were successful, when the switch was pulled for regular broadcasting, the operators in charge found themselves listening to nothing. An investigation showed that the cable leading to the antenna was cut. Harold Hadden, technical man in charge, who discovered the cut, saw no one around at that time, but from the general appearance of the wire, it could be seen that it was an intentional break, since it was badly bent and twisted around the point of the cut. This was the opinion of Sergeant Joseph Rosentengel of the Fort Lee police, also.

This station recently moved its transmitter to the Palisades, opposite 181st Street, and above the Palisades Park about a mile and a half above Fort Lee. The studio is still in N. Y. City. It is still incomplete and the lead-in wire, which is to be buried in a conduit, at present lies along the line. This was the wire that was severed.

Dr. Charles D. Isaacson, director of the station, thought it quite possible that the wire was cut by some one with an animus against the station.

Records Synchronize With Radioed Jazz

A new fad is raging among the radio fans, according to several letters received by George Olsen, the leader of the Hotel Pennsylvania Orchestra, one of WJZ's dance favorites. It seems that at 10:45 p. m. Tuesdays, and 7 p. m. Thursdays, some of the radio fans put a George Olsen record on their phonograph and wait for George's music to play that particular selection over the radio. As soon as the number is announced, the phonograph is started and the same piece is heard from two sources. Unless the two instruments are perfectly synchronized the effect is not the best, but the radio fans seem to be having a good time playing with the thing, and that's about all that matters. A few complaints have been received that George does not play at the same speed when recording and when broadcasting. The cause of these complaints, it has been found, is due to the fact that the speed regulators on the phonographs required adjusting. When the adjustment was made, the tempo was found to be identical in both record and broadcast.

MU-6 PRICE REDUCED

The Daven Radio Corporation of Newark, New Jersey, announces the new price of \$4.50 on its MU-6 Power Tube. This represents a drop in price of \$1.00. This was due to the increased demand, which increased production and reduced price.

NOTED FOLKS SURROUND MIKE



ARTHUR WILLIAMS, vice-president of the New York Edison Company; Jack Cromwell; Princess Murat, huntress, explorer and writer; Dr. Charles D. Isaacson, program director of WRNY; Fanny Brice, and Wallace Eddinger (left to right), before the microphone of WRNY, after the broadcasting of a play.

COST STAGGERING TO NEW STATIONS

Air Congestion Relief Deemed in Sight As Revenues Lag Behind Huge Expenses—Chains Make Money

WASHINGTON

Relief is in sight from the interference due to congestion of stations regardless of Congressional action this Winter. Government experts who have analyzed the situation are confident that the present large number of stations will not continue in operation even if the Government does not step in and demand a new deal.

This opinion is based on the law of supply and demand and the theory that most of the stations will not be able to support themselves.

Want Share of Gold

The influx of new stations is accredited by experts to the desire of their owners to share in the supposedly large amounts of money being spent for advertising via radio. Although there has never been definite proof that any station in the United States has made money from selling time, well established belief is that it is a most profitable business.

According to an analysis, most of the radio advertisers are national in their scope and seek primarily to obtain national audiences. With the exception of one or two chain groups, most of the stations are in a position to serve only a local community.

This eliminates them from the plans of the national advertiser unless they are linked up in a chain. While there is a certain amount of local advertising that may be placed on the air, it is not considered sufficient to support a powerful station.

Field Is Restricted

The belief is that after experimenting several months with broadcasting and discovering that it is not a profitable undertaking, many of the newly licensed stations will give it up as a bad bargain.

This theory, of course, cannot be made to apply to stations owned by large companies which seek only to advertise themselves and do not depend on selling time for support. There is also a number of schools, colleges and churches which broadcast without hope of remuneration.

NEW STATION FOR SPOKANE SPOKANE, Wash.

Vincent Kraft, president of the Northwest Radio Company of Seattle, now erecting the super-broadcasting station here, was a visitor recently. He arrived to inspect the plant, and possible location for a downtown broadcasting studio.

The new plant, with its downtown studio, will represent an investment of nearly \$100,000.

NEW STATION LIST MOUNTS; IT IS NOW 110

Where Newcomers Will Find Room on the Wavelength Spectrum Without Disturbing Other Broadcasters Is a Problem — List Itemized by Districts

WASHINGTON

Plans are in progress for the construction of 110 new broadcasting stations, according to reports received by the Radio Section of the Department of Commerce. Where these stations will find wavelengths without seriously disturbing stations already in operation, or whether Congress will enact a law before they are ready for operation is not known.

The announcement of the new stations was contained in a second report from Supervisors of Radio throughout the country. The report is a supplement to the one of October 15. Under the new plan, the supervisors are required to report every fifteen days on changes or contemplated changes in their districts.

Conditions Called Worse

After analyzing the reports, Chief Radio Supervisor W. D. Terrell says, conditions are not as bad as originally indicated, but "much worse."

The second report shows the following:

New stations in actual operation since July 1 are 75, an increase of 12 since October 15.

76 stations have increased their power since July 1, an increase of 13 since October 15.

74 stations have jumped wavelengths since July 1, an increase of 12 since October 15.

70 new stations are under construction, an increase of thirty since October 15.

50 stations are preparing to increase their power, an increase of four since October 15.

Plans are in progress for the construction of 110 new stations, an increase of 28 since October 15.

Increased Power

Of the new stations licensed since the first of July, 17 are equipped to use power of 500 watts or more, while 13 of the old stations have increased their power to 500 watts or more.

The summary by districts follows:

First District, Boston: 7 new stations, 4 increased power, 10 changed wavelengths, 6 under construction and 6 stations planned.

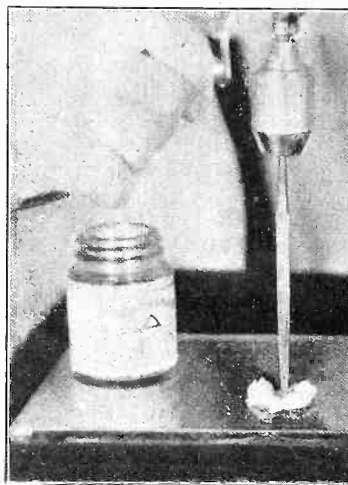
Second District, New York: 14 new stations, 7 increased power, 8 changed wavelengths, 2 under construction, 11 preparing to increase their power and plans in progress for 20 new stations.

Third District, Baltimore: 2 stations with increased power, 2 changed wavelengths, and 5 preparing to increase their power.

South and West

Fourth District, Atlanta: 7 stations with increased power, 5 stations under

DRILLING GLASS



DRILLING GLASS is an easy task if this method is used. Place a small three-cornered file in the chuck of a hand drill. Make a little mountain of putty around the spot to be drilled, scoop out a little depression and fill with a few drops of turpentine. Then drill in the same manner as when using regular drills.

construction, and 3 preparing to increase their power.

Fifth District, New Orleans: 10 new stations, 6 with increased power, 4 have changed wavelengths, 10 stations are under construction, 11 are preparing to increase their power, and plans are for twelve new stations.

Sixth District, San Francisco: 2 new stations, 4 with increased power, 14 have changed wavelengths, 6 are under construction and 7 are planned.

Seventh District, Seattle: 8 new stations, 26 with increased power, 24 have changed wavelengths, 6 are under construction, 3 are preparing to increase power, and 11 stations are planned.

Eighth District, Detroit: 8 new stations, 11 with increased power, 4 with changed wavelengths, 3 under construction, one preparing to increase power and 36 new stations planned.

Ninth District, Chicago: 26 new stations, 26 with increased power, 24 have changed wavelengths, 32 are under construction, 16 are preparing to increase power and 18 new stations are planned.

Seven New Stations

WASHINGTON

Seven new stations have been licensed, three stations have changed their wavelengths and one station has discontinued operation. The new stations follow:

WICC—Bridgeport Broadcasting Stations, Bridgeport, Conn., 285 m., 1052 kc.

WLBC—D. A. Burton, Muncie, Ind., 223.7 m., 1340 kc.

WLBE—J. H. Fruitman, Brooklyn, N. Y., 230.6 m., 1300 kc.

WFBE—Garfield Place Hotel, Cincinnati, O., 232.4 m., 1290 kc.

WOMT—Mid'adow Theatre, Manitowoc, Wisc., 254.1 m., 1180 kc.

KGDI—Northwest Radio Service Co., Seattle, Washington, 416.5 m., 720 kc.

KGDJ—R. Rathert, Cresco, Iowa, 202.6 m., 1480 kc.

CHANGES

KSO—Clarinda, Iowa, from 241.8 to 405.2 meters, 740 kc.

WCAM—Camden, N. J., from 236.1 m. to 336.9 meters, 890 kc.

KFPY—Spokane, Washington, from 273 m. to 272.6 m., 1100 kc.

WFBE—Seymour, Ind., discontinued.

Eveready Hour Gets Elsie Janis

Elsie Janis has been engaged for an Eveready Hour program to be broadcast in December.

The program in which Miss Janis will appear is being prepared by the program directors of the Eveready Hour who are working on an interesting adaptation of Miss Janis' famous stage mimicry to radio broadcasting.

Elsie Janis is one of the best known of American stage stars. She is a native-born American and has played in musical comedy and vaudeville successes. During the world war she spent several months with the American Expeditionary Forces in France, entertaining American soldiers and their French and British compatriots.

Miss Janis' first stage appearance was as "Cain" in "The Charity Ball." A year later she went into vaudeville. After five years of vaudeville work she had attracted such favorable attention that she was starred in "The Belle of New York," in 1904. Her next appearances were in "The Fortune Teller" and "The Vanderbilt Cup." At the close of her engagement with the latter, in 1908, Miss Janis went under the management of Charles B. Dillingham, first in "The Hoyden" and later in "Fair Co-eds" and "Slim Princess." Her first notable appearance after the war was in her own production called "Elsie Janis and her Gang."

Cone Toward Wall Increases Volume

Tests conducted in the engineering laboratories of the Crosley Radio Corporation show that a majority of the single-cone type of loud-speakers on the market give greater sound volume to listeners directly in front of the speaker when they are placed with the point of the cone in the direction opposite to that of the listeners than when they are placed with the point of the cone toward the listeners.

Thus fans who have placed their loud-speakers with the cone pointing away from the wall will usually find that they can slightly increase the sound volume by turning the speaker around so that the inside of the cone points toward the listeners. This hint will be found valuable in tuning to weak signals.

Engineers explain this slight difference by the fact that the cup-shaped transmitting motion to the surrounding air than the slanting outside surface of the cone. Stronger waves are therefore set up by the inside of the cone than by the outside.

U. S. Is First In Compass Stations

Development of radio communication and under water sound apparatus was described by Commander Stanford C. Hooper, U. S. N., at the thirty-fourth annual convention of the Society of Naval Architects and Marine Engineers at the Engineering Societies Building, New York City.

The United States now leads the world in the number of naval radio compass stations, operating fifty-three of them, Commander Hooper said. These stations and twenty-seven radio beacons furnish invaluable service to all ships equipped with radio, he declared. Aircraft uses the radio in the same way that ships do, he said.

RADIO BILL FACES NEW OBSTACLE

Members of Congress Discover Provision in Dill Resolution Deemed to Put Federal Government in Competitive Commercial Telegraphy

By Thomas Stevenson

WASHINGTON

Government officials and members of Congress are just beginning to awaken to the far-reaching effect of a provision in the Dill radio bill which passed the Senate and is in conference between the Upper and Lower House.

If enacted into law, it would mean the establishment of a giant new government owned communications system by throwing open hundreds of Army and Navy radio stations to general public use.

Most members of Congress did not take the provision seriously when it came up for consideration. Impressed by the activities of commercial companies which would be vitally affected, three members recently made a study and analysis of the provision. It follows:

"Section 13. Any Government station engaged in transmitting or receiving radio communications relating to Government business, compass reports, the safety of ships, or press messages, including Government stations in the Philippine Islands, is hereby authorized to be used for general commercial business when such use does not interfere with the use for Government purposes as aforesaid, but Government business shall have precedence over commercial business: Provided, that rates fixed for such commercial business, except press rates, shall be substantially the same as the rates charged by privately owned and operated radio stations for like communications and services, and no Government station shall be permitted to make unjust charges or show discrimination and that said rates, including press, shall be subject to control by the commission: And provided further, that receipts from such commercial business shall be covered into the Treasury as miscellaneous receipts. Whenever in the judgment of the Commission the enforcement of this section within the Territory of Alaska, or the Virgin Islands, Porto Rico, American Samoa, Guam, or the Territory of Hawaii would not be in the public interest, and the commission shall so certify to the head of the Government department operating any radio station in such Territory and Insular possession, the application of the section within such Territories and Insular possessions shall be suspended for such time as said certificate remains in force."

Competition Discussed

A limited number of government stations has always engaged in commercial business. These stations are in places, however, where no other communication facilities are available, such as Alaska and American Insular possessions.

It was believed that the intention was to continue this custom, in contrast to which the Dill bill says that the Commission may suspend the enforcement of the provision within Alaska, Virgin Islands, Porto Rico, American Samoa, Guam and Hawaii.

The army has radio stations in practically every large city of the United States and if the bill were strictly interpreted, would be compelled to engage in

competition with existing telegraph companies.

The Navy has stations reaching outlying sections of the globe, and they would be compelled to engage in competition with existing cable and wireless companies.

Several Senators have indicated that they will attack the provision and a demand will be made that the bill be recalled from conference for reconsideration.

Men who are in close touch with the situation fear that the row that may result from debate of the provision may hold up final enactment of a radio law for a long time.

(Copyright, 1926, by Stevenson Radio Syndicate)

KEEP LAMP AWAY

Many take pains to place their A or B eliminators far away from their receivers, but place a lamp which is operated from the main very close to the set. They then blame the eliminators for causing a hum. All apparatus operated from the mains AC or DC, should be kept from the receiver.

WHITE ASKS TEST OF INTERFERENCE

WASHINGTON

Representative Wallace White, of Maine, author of the White Radio bill, has under consideration a proposal to confer upon the radio inspection service the authority to investigate all cases of interference to radio reception.

For the last few months the radio inspection service has refrained from all activities except the inspection of stations. Previously, whenever possible, the inspectors attempted to relieve extreme cases of interference due to leaky electric lines, etc. Following the Department of Justice ruling that the department had no authority these activities were curtailed.

Authority Doubted

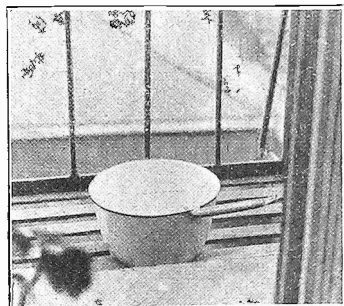
Officials of the Department of Commerce do not believe the White bill, as at present framed, confers the authority for inspectors to investigate cases of non-radio interference. At the same time it is felt that the inspectors should be required to co-operate in this work to a certain extent.

Representative White may propose that a clause something like this be included into the law:

Companies Helpful

"When it does not seriously conflict with their other duties, radio inspectors shall investigate complaints of interference of a non-radio character. When the source of the interference has been discovered, the company which is responsible shall be notified and shall remedy the trouble within ten days under penalty of punishment."

OF NO USE



(Hayden)

RAIN WATER may be used for storage batteries but should be collected in a stone crock, out in "the great open spaces," not on the fire escape as shown, since iron drippings and other foreign matter go into the solution.

ITALY TO U. S. IN HOUR

WASHINGTON, D. C.

When Miss Elizabeth Zandonini of this city received a radiogram from a friend in Italy recently she was somewhat surprised to note that the message had been filed in Italy only an hour before she had received it in this country. A checkup on the routing showed that an Italian amateur had sent it on short waves direct to an American amateur in Philadelphia, who in turn passed it on immediately to an amateur in Washington, the latter completing the fast delivery by telephoning to Miss Zandonini's residence.

It is believed that such a clause would not be objectionable to the electric companies, because most of the interference is due to leaks, which cause a waste of power. Location of these leaks by inspectors, it is said, would be welcomed by the companies which would be only too glad to repair them.

Even without the law, the companies have shown an eagerness to help in this kind of work for their own personal benefit and to win the good will of the public by improving reception.

A decrease of around \$100,000 will be made in the annual appropriation of the radio inspection service for the coming fiscal year, it has been learned. Last year Congress appropriated around \$350,000 for the radio inspection service, which was to have been used to increase the field force and provide better instruments for the location of interference.

Can't Anticipate Law

The Department of Commerce, however, felt that the Department of Justice ruling curtailed its activities in this connection and a large part of the appropriation has not yet been touched. Unless a law is passed before the end of the fiscal year around \$100,000 of last year's appropriation will be turned back to the Treasury.

Estimates for the appropriation for the coming fiscal year were based on the assumption that no law would be passed because Government departments are not allowed to anticipate legislation in this respect.

THOUGHT FOR THE WEEK
If radio never does anything more than bring a ray of sunshine and moments of happiness into the lives of the shut-ins, it still will be one of nature's greatest blessings, and add a note of tenderness to the perfect symphony of science.

RADIO WORLD

REG. U.S. PAT. OFF.

The First and Only National Radio Weekly

Radio World's Slogan: "A radio set for every home."

TELEPHONE BRYANT 0558, 0559
 PUBLISHED EVERY WEDNESDAY
 (Dated Saturday of same week)
 FROM PUBLICATION OFFICE
 HENNESSY RADIO PUBLICATION CORPORATION
 145 WEST 45th STREET, NEW YORK, N. Y.
 (Just East of Broadway)
 ROLAND BURKE HENNESSY, President
 M. B. HENNESSY, Vice-President
 FRED S. CLARK, Secretary and Manager
 European Representatives: The International News Co.
 Brema's Bldg., Chancery Lane, London, Eng.
 Paris, France: Brenano's, 8 Avenue de l'Opera
 Chicago: William A. Diehl, 30 North Dearborn St.
 Los Angeles: Lloyd B. Chappell, 611 S. Coronado St.

EDITOR, Roland Burke Hennessy
 MANAGING EDITOR, Herman Bernard
 TECHNICAL EDITOR, Lewis Winner
 ART DIRECTOR, J. Gerard Sheedy
 CONTRIBUTING EDITOR, James H. Carroll

SUBSCRIPTION RATES

Fifteen cents a copy. \$6.00 a year, \$3.00 for six months. \$1.50 for three months. Add \$1.00 a year extra for foreign postage, Canada, 50 cents.
 Receipt by new subscribers of the first copy of RADIO WORLD mailed to them after sending in their order is automatic acknowledgment of their subscription order. Changes of address should be received at this office two weeks before date of publication. Always give old address; also state whether subscription is new or a renewal.

ADVERTISING RATES

General Advertising

1 Page, 7 1/4"x11"	462 lines.....	\$300.00
1/2 Page, 7 1/4"x5 1/2"	231 lines.....	150.00
1/4 Page, 8 1/2"x7 1/2"	231 lines.....	150.00
1/2 Page, 4 1/2"x7 1/2"	115 lines.....	75.00
1 Column, 2 1/4"x11"	154 lines.....	100.00
1 Inch.....		10.00
Per Agate Line.....		.75

Time Discount

52 consecutive issues.....	20%
26 times consecutively or E. O. W. one year.....	15%
4 consecutive issues.....	10%

WEEKLY, dated each Saturday, published Wednesday.
 Advertising forms close Tuesday, eleven days in advance of date of issue.

CLASSIFIED ADVERTISEMENTS

Ten cents per word. Minimum 10 words. Cash with order. Business Opportunities ten cents per word, \$1.00 minimum.

Entered as second-class matter March 23, 1922, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

CIVIL SERVICE

The United States Civil Service Commission announces the following open competitive examinations: Associate radio engineer, \$3,000; assistant radio engineer, \$2,400. Applications for associate and assistant radio engineers must be on file at Washington, D. C., not later than December 30. The examination is to fill vacancies in the Signal Service at large of the War Department at McCook Field, Dayton, Ohio, and Fort Monmouth, New Jersey, and vacancies occurring in positions requiring similar qualifications.

Competitors will not be required to report for examination at any place, but will be rated on their education, experience, and fitness; and publications, reports, or thesis to be filed with the application.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of United States Civil Service Examiners at the Post Office or Custom House in any city.

YOUNG EXPECTS OVERSEA MUSIC

In Message to British Broadcasting Company, Sent From Schenectady to Public Abroad, He Prophesies International Programs

Listeners in Great Britain heard the remarks of Owen D. Young, broadcast from the General Electric short-wave station, 2XAF, Schenectady. Mr. Young, chairman of the Board of General Elec. Co., and a collaborator on the Dawes plan, was unable to appear at the microphone, so an operator read his remarks. The waves used simultaneously were 32.79 and 26.8 meters. The occasion of the speech was the fourth anniversary of the British Broadcasting Company. The message:

I send my good wishes to the British Broadcasting Company on its fourth birthday, and my congratulations to the people of England and Scotland on the service which it has performed.

Each generation brings into being new children, who are different from any of their ancestors and who will be unlike any of their descendants. This generation has brought radio into being. It has no nationality or birth. Even Marconi, who has the greatest claim, would be the first not only to admit but to praise contributions of inventors and engineers in every land.

Radio not only recognizes no nationality of birth but it admits of no national limitation of performance. It brazenly passes through all ports of entry; it pays no customs duties; it defies fortresses and frontiers. Only the barriers of language can prevent its universal application.

Make Life Better

True it is that the physical agencies of transmission must be physically located, and therefore, they are subject to national control. Like lighthouses, these broadcasting antennas lift their heads in every land, and their business truly is to enlighten and make more easy the ways of the people whom they serve.

They throw out ideas and information for education. They scatter music and sports for entertainment. Like all in-

struments of great power, they must be widely and conscientiously used. To turn them to wrong purposes would make them engines of destruction.

The problem of the British Broadcasting Company in serving 44,000,000 people in 95,000 square miles differs much from that of our American stations, which serve 110,000,000 people in nearly 3,000,000 square miles.

Method Is Different

Not only do the technical and physical problems differ, but the entire method of control and character of use differs. The differential in time alone between San Francisco and New York is almost as great as that between London and New York. The diversity of our interests leads to diversity of programs, and therefore, diversity of control.

Take agriculture alone. The wheat-growing farmers of the Northwest are interested in quite different problems from the cotton producers of the South. In England you have not only a more concentrated population and a more homogeneous people, but you have more closely unified interests.

Stations Contrasted

It is to be expected, therefore, that your method of dealing with broadcasting would differ from ours. We have roughly 600 stations—you have approximately 21. There are, however, here, with all of our diversity, programs of national interest which we are making provision to broadcast nationally. The time will soon be here when programs of international interest, especially between English-speaking peoples, may likewise be broadcast internationally.

At some other birthday of yours, we will not only send you our best wishes and congratulations, but we will listen in throughout America to your birthday celebration.

LETTERS TO THE EDITOR

Editor Radio World:

I was much interested in an article in Radio World for November 13, 1926, entitled, "WLWL's Beat Annoys Fans in Cleveland."

Of course the folk in Cleveland know what they hear there. Locally there is absolutely no QRM either way between WTAM and WLWL. There is some interference or rather blanketing by WFI and WLIT, two of our locals who are just as much below WTAM as WLWL is above them.

The real interference with WTAM comes from WODA of Paterson, N. J., operating on a "pirated" wave of 390.9 meters. It would seem to me that to the fans to whom WTAM is a 3,500 watt local a 500 watt station, say 300 miles away ought to be inaudible save on a very

sensitive receiver.

As to the variation of wave of WLWL we do not find it. The wave is always sharp, as indicated by the invariable dial setting of a Neutrodyne circuit. Locally WLWL does not interfere with WGY on 379.9 nor does WGY interfere with WLWL.

Of course there is interference with WMBF as there will be anywhere with two stations on the same wave. If you want real heterodyning take a little venture into the 250 to 280 meter wave band! As well expect to select the saxophone from the orchestra in your speaker.

But these things all lend interest to our reading.

PAUL A. HERR.
 6322 Baynton Street,
 Philadelphia, Pa.

GEN. HARBORD GIVES HONOR TO FOOTBALL

First In Field of Sport, He Says, Discussing Listeners' Preferences—Broadcasts of Only Big Events Popular

Of the sports, football has had the most amazing leap in general popularity (with radio listeners). Where football interest formerly was chiefly collegiate, all classes now follow it as the announcer's voice pictures the struggle and suspense of the play. I have often thought that the popularity of football by radio may be due to the fact that the listener, following play by play, imagines himself out there on the white-lined gridiron, squirming, dodging, racing through a broken field and performing deeds of strength and valor such as he has no opportunity of performing in the humdrum daily life.

Event Must be Good

However, it is a dark day for the station director if he picks a poor sports event for broadcast. If you attend a great fight and the fighters are not evenly matched, the excitement of the ringside may in some degree gloss over the fact. But the voice of the accurate announcer relentlessly tells the story of blow after blow and the radio listener "sees" the fight clearly in all its defects. I do not know whether the listener writes to the promoter responsible for a poor fight, but it is certain that he is likely to write to his broadcast station about it.

Services Popular

Although we have heard much discussion of the churches, their attendance and support, the broadcasting of services has been so popular as to indicate a strong religious influence in the country. However, if we put a Methodist on the air tonight we must follow up quickly with a Presbyterian, and so on down the line. Radio must have a balanced religious program.

I often think that we like to pretend to be a little more "common" or "rough-necked" than the facts warrant. The other day I noticed a boy come trudging around a corner whistling an air I did not at first place; then I realized it was Anitra's Dance from "Peer Gynt." A generation or so ago boys whistled "A Hot Time." That tells a story.

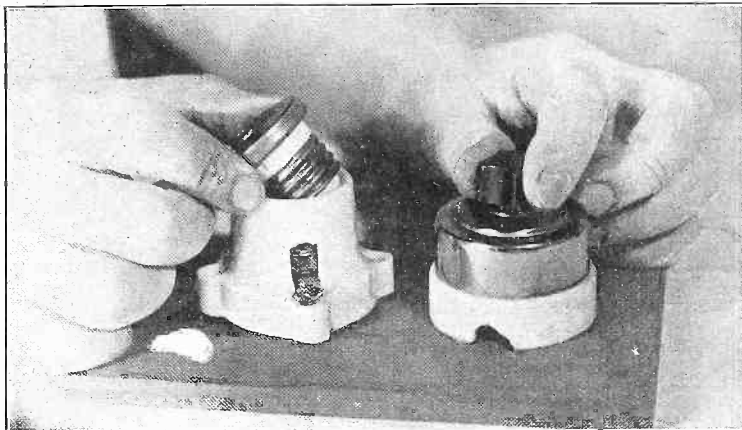
Jazz Circles World

American jazz swept around the world; then along came radio and gave us all kinds of music. No one has been more amazed than have radio leaders to discover how much of the so-called "long haired music" Americans will enjoy—and ask for more.

Our investigations show that less than 10 per cent. of our listeners want "jazz" today. Consequently, in the "home of jazz" this product hitherto considered typically American is being kept off our program until 10 o'clock.

—Gen. James G. Harbord, president of the R. C. A., in the "N. Y. Times Magazine."

FUSE HOUSE CURRENT LEADS



STANDARD porcelain sockets and fuses, in connection with snap switches, form handy protection when the house current is used. Voltage above that normally used causes the fuse to blow out, thus protecting the line and set. The fuses can be secured to blow at standard ampere rate, stamped on the fuse itself.

OVERSEA 'PHONE HELD IMMINENT

Carson In Annual Report Predicts Commercial Service Between United States and Great Britain In Near Future—List of Amateurs Decreases

Radiotelephone commercial service between the United States and Great Britain in the near future is a reasonable probability, according to D. B. Carson, United States Commissioner of Navigation, in his annual report.

Tests which have been conducted show encouraging results, but it is pointed out, the difference in time in connection with office hours of banks, stock exchange and brokerage houses may present some difficulty.

Commercial pictoradiogram services, the report reveals, are now in operation between New York and London and San Francisco and Hawaii. By means of this development, photographs, pictures, advertisements, legal documents, bank checks, cartoons, fingerprints, and similar pictorial or printed matter are quickly transmitted and reproduced. This new field, the Commissioner states, may develop into an important branch of radio communication.

Broadcasting stations in this country on June 30, 1926, decreased slightly during the past fiscal year, totalling 528 licensed stations as compared with 571 last year and 535 in 1924. There has been a material increase in power used. The average power per station in watts is 715.8 as compared with 312.4 last year and 190.5 the year previous. During the past fiscal year, 117 new stations were licensed and 160 discontinued. The previous year 281 new stations were licensed and 245 discontinued.

Fewer Amateur Stations

On June 30, there were 14,902 active amateur radio stations in the United States, according to the report. There was a considerable decrease in the number of these stations licensed during the fiscal year as compared with 1925, the figures being, respectively, 8,037 and 10,074. During the year under review 3,209 amateur stations were discontinued. Amateurs in

this country, the report points out, are taking advantage of all improvements made in the art and are inclined to more readily adopt new ideas than is possible with the larger stations where much experimenting must be done before changes are made which involve large expenditure of time and money. Practically all amateurs are now using continuous-wave transmitters, many of them having crystal control. With the amateurs, the spark set is considered obsolete as is the crystal receiving set.

At the close of the year under review, there were 1954 vessels equipped with radio as compared with 1,901 during the year previous. Considerable progress was made during the year in converting spark transmitters on ships to the more modern type tube transmitters, which increase the range of the station and produce much less interference. It is not unusual for ships equipped with continuous-wave apparatus, tube or arc, to maintain daily communication with land on a trans-Atlantic voyage.

Radio compasses were in use in 230 American merchant vessels at the close of the fiscal year compared with 83 during 1925, the report discloses. The value of this equipment as an aid to navigation and for the purpose of locating vessels in distress is now generally recognized by steamship companies.

The Marine Regulation

Continued growth in the use of radio is predicted by Commissioner Carson, together with improved service to the public. However, he states that in the absence of adequate radio laws, it is difficult to forecast just what the actual conditions may be during the coming Winter.

Referring to the marine regulatory activities of the Bureau of Navigation, the report points out the need for a unification of the different Federal agencies which participate in this work.

TELEPHONE TOUR IS WEAFF'S STUNT

Mary Garden at Chicago, and Will Rogers, at Independence, Kan., Heard at Celebration of New Ownership—24 Stations Transmit Event

Radio listeners throughout a greater part of the United States heard Mary Garden, Will Rogers, Weber and Fields and a host of other noted artists and musical organizations in a four-hour radio program marking the formal bow of the National Broadcasting Company, the new owners of WEAFF. The program was broadcast simultaneously by twenty-two stations linked with WEAFF and WJZ in New York City. The majority of the program was presented before a microphone installed in the grand ballroom of the Hotel Waldorf-Astoria in New York City, where more than 1,000 guests made up a visible audience.

A remarkable demonstration of the use of telephone lines as an adjunct for broadcasting was displayed when, without interruption of the program, the announcer at the Waldorf introduced Mary Garden. She was standing before a microphone in her apartment studio in the Hotel Belmont, Chicago. Miss Garden immediately began her program, several septimo solos, and was heard by the audience in the Waldorf in addition to those listening into receivers.

Rogers Is Heard

Later the same demonstration was witnessed when Mr. Rogers was introduced from New York and replied with a fifteen minute program from his dressing room in Memorial Hall, Independence, Kan., where he was appearing at a show.

The broadcast was opened at 8 p.m. New York time with an address by Merle H. Aylesworth, the newly elected president of the National Broadcasting Company sponsors of the program. In a five minute talk Mr. Aylesworth told of what the new company was attempting to do in its work as a program maker.

"We are attempting, in this evening's presentation, to give you just a glimpse of the goal we will strive to reach in the make up of programs under our supervision," he said.

In addition to Miss Garden, Mr. Rogers and Weber and Fields, the following artists and musical organizations participated: Titta Ruffo, baritone of the Metropolitan Opera Company; Harold Bauer, pianist, who was engaged while in Europe and found it necessary to advance his sailing date to arrive in time for the broadcast; the New York Symphony Orchestra, Walter Damrosch conducting; the New York Oratorio Society, Albert Stoessel conducting; the Goldman Band, Edwin Franko Goldman conducting; an Operatic Sextette, direction of Cesare Sodero, and consisting of Mesdames Genia Ziefuska and Devora Nadworney and Giuseppe di Benedetto, Milo Picco, Justin Lawrie and Nino Ruini, all artists well known to a large radio audience; a light opera company, also under the direction of Mr. Sodero, and composed of Mesdames Adele Parkhurst and Frances Paperte, and George O'Brien, Justin Lawrie, Theodore Webb and Jack Oakley; Vincent Lopez, George Olsen, Ben

Bernie and B. A. Rolfe and their respective orchestras.

Stations In Chain

The following broadcasting stations participated in the simultaneous transmission of the program in addition to WEAFF and WJZ in New York City, WEEI, Boston; WJAR, Providence; WBZ, Springfield (Mass.); WTAG, Worcester; WVIC, Hartford; WDRG, New Haven; WGY, Schenectady; WOL, Buffalo; WLII, Philadelphia; WRC, Washington, (D.C.); WCSH, Portland (Me.); WCAE and KDKA, Pittsburgh; WTAM, Cleveland; WSAI, Cincinnati; WWJ, Detroit; WGN and WYU, Chicago; WHAD, Milwaukee; KSD, St. Louis; WCCO, Minneapolis-St. Paul; and WDAF, Kansas City (Mo.).

One of the surprises of the evening was the display of a photograph taken of Mary Garden while she was singing in her room in the Hotel Belmont, Chicago. It was transmitted to New York City over the telephone lines of the American Telephone and Telegraph Company and flashed on the screen as a stereopticon to the visible audience in the Waldorf before the four hour program had ended.

Advisory Board Named

Mr. Aylesworth announced the names of the members of the Advisory Radio Council, made up of representatives of various professions and phases in public life, which will advise as to the best type of program from the public's point of view. The list:

Walter Damrosch, conductor New York Symphony Orchestra

A. E. Alderman, president University of Virginia

John W. Davis, lawyer

Francis D. Farrell, president Kansas Agricultural College

William Green, president American Federation of Labor

Major General James G. Harbord, president Radio Corporation of America

Rev. Charles F. McFarland, general secretary Federal Council of Churches of Christ in America

Morgan J. O'Brien, lawyer

Dr. Henry S. Pritchett, president Carnegie Foundation

Henry M. Robinson, president First National Bank of Los Angeles

Flihu Root, lawyer

Johus Rosenwald, president Sears-Roebuck Company

Mrs. Mary Sherman, president General Federation of Women's Clubs

General Guy E. Trippe, chairman of the Board Westinghouse Electric and Manufacturing Company

Owen D. Young, chairman of the Board General Electric Company

The navy's chief of operations and chief of staff of the army have also been invited to serve so that the army and navy may be in constant touch with the broadcasting field, and so that the broadcasting facilities may be immediately available in time of national defense.

MARY GARDEN

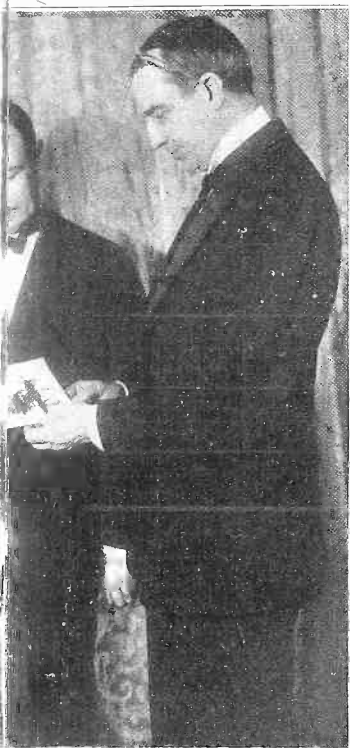


DAVID SARNOFF, M. H. Aylesworth of Mary Garden sent via wire from Chicago broadcast as part of the inaugural casting Com

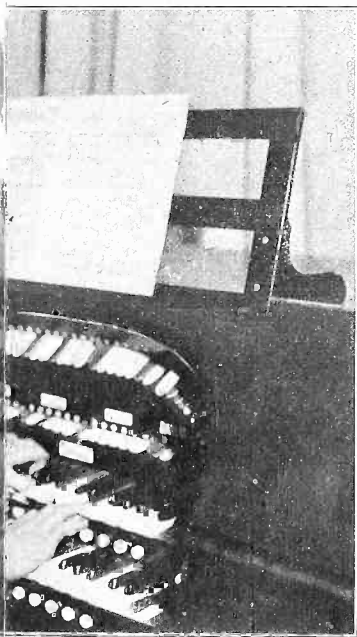


THE ORGAN is one of the most difficult the Crosley station in Cincinnati, Ohio, as perfect as possible, with the aid of a and audio amplifier. Many prominent plimented its wonderful tonal quality. thousands of listen

PHOTO BY WIRE



Owen D. Young inspecting the photo to New York City simultaneously with program of WEAf under National Broad- management.



struments to transmit perfectly. WLW, ever, makes sure that this transmission is fully constructed studio organ shown above ts have played on this organ and com- same opinion has also been given by the a who have written.

REALISM CARRIED FROM GRIDIRON

Use of Only Two Microphones Provides the Crowd Atmosphere to Enliven Things at the Listener's Home

"How do you do it? How many mikes do you use?"

Those are only two of the many questions fans are asking Hal and Harry, football announcers of WMAQ.

Hal and Harry give a lot of the credit for their successful broadcast to Walter R. Lindsay, chief operator, who, with the other operators, has worked out the present method.

"Not so long ago," explains Mr. Lindsay, "it was thought the more mikes the better broadcast. But experience shows that fewer mikes, properly placed, give better results."

"To make the game realistic for the fans attending the contest via radio, there are but two microphones. One is placed down near the band in the center of the stand and the other within the glass enclosed broadcast booth."

"A mixer panel is used so that the microphone near the band may be kept slightly open all the time to permit a continuous background of cheers and music for the play-by-play account of the game by the announcer, which comes through the second microphone within the booth."

The creation of the crowd atmosphere is a goal all stations seek.

"Radio Educates," Says Manufacturer

Radio has accomplished something that the phonograph has never been able to do, according to Herman Rose, president of the Shamrock Manufacturing Company of Newark, N. J.

"Radio has made people listen to talks and lectures, to schools and politics," he said.

"The phonograph has tried to teach via the record route, but has never been successful. It has tried to put humorous monologues and dialogues into the home, but they always seemed to stay in the music store. The record maker has learned through bitter experience that phonographs are not built for speech reproduction."

"But radio, scorned by Edison, has done all these things."

"Radio colleges today have a greater number of students than a combination of all the regular colleges. Radio pupils tune in their lessons with a regularity that would put the remittance college man to shame. Radio can and does teach."

Farming Broadcast Proves Successful

The Department of Agriculture announced that radio has definitely proved itself an effective vehicle for the diffusion of agricultural information. The announcement follows:

The radio has definitely proved to be an effective new vehicle for diffusion of the department's information. Since October 4, when the new Fall schedule of programs went on the air, the response from broadcasting stations and farm homes has been enthusiastic. Thousands of letters, an average of about 500 a day, asking for enrollment cards, bulletins, and information, have been flowing in to the Radio Service. Stations write to express their own appreciation and that of their audiences. Farmers, who ordinarily find little time or inclination for correspondence, write many letters of appreciation and commendation. That the department's programs are successfully holding their own in the competition on the dials is evidenced by the numerous letters received.

Set For All Soon, Says Werrenrath

The musical leadership of the world will pass from Europe to America within the next generation largely because of radio developments, according to Reinald Werrenrath, American baritone, who believes practically every American home will have a radio within the next five years.

"Radio is bringing the finest music to the smallest farm," he added, "and it is a natural result that children will absorb its beauty, and will grow up with a finer appreciation of beauty and culture than their parents."

This popular concert artist was the first of the internationally famous singers to broadcast in the Atwater Kent Sunday night concert.

"By popularizing the classics, the phonograph and radio have contributed immeasurably to America's musical appreciation," he added. "Just how far reaching the effect of radio will be it is impossible to predict. In fact, it is overwhelming when one considers the possibilities of it, and the breadth of its influence. I was told that some time in the future we shall heat our homes and run our automobiles by radio. I do not doubt it, for if any one had told us ten years ago that the radio could do what it is doing today, we should have derided the idea."

Professor to Tell How to Pronounce

The educational effect of broadcasting may be exaggerated in some quarters but there is little doubt that it has a tremendous educational bearing on language and the art of speaking correctly. As programs which come to listeners by radio appeal almost wholly to the ear, pronunciation and grammatical construction of sentences are factors in molding the habits of people in speaking. With this thought in mind Professor William Tilley, Ph.D., will be heard in the regular weekly series of Columbia University lectures from WEAf on Mondays at 7:10 p. m.

Professor Tilley, who will give hints on the phonetics of speech, studied under Henry Sweet of England, and Prof. W. Vieter, Univ. of Marburg, Germany.

TELEPHONE TOUR IS WEAF'S STUNT

Mary Garden at Chicago, and Will Rogers, at Independence, Kan., Heard at Celebration of New Ownership—24 Stations Transmit Event

Radio listeners throughout a greater portion of the United States heard Mary Garden, Will Rogers, Weber and Fields and a host of other noted artists and musical organizations in a four-hour radio program marking the formal bow of the National Broadcasting Company, the new owners of WEAF. The program was broadcast simultaneously by twenty-two stations linked with WEAF and WJZ in New York City. The majority of the program was presented before a microphone installed in the grand ballroom of the Hotel Waldorf Astoria in New York City where more than 1,000 guests made up a vast audience.

A remarkable demonstration of the use of telephone lines as an adjunct for broadcasting was displayed when, with only a few minutes of the program the announcer at the Waldorf introduced Mary Garden. She was standing before a microphone in her apartment studio in Chicago. Immediately before her program, several minutes before she was heard by the audience at the Waldorf in addition to those listening on receivers.

Rogers Is Heard

Later the same demonstration was witnessed when Mr. Rogers was introduced from New York and replied with a fifteen minute program from his dressing room in Manhattan. He had Independence, Kan., where he was appearing at a show.

The broadcast was opened at 8 p.m. New York time with an address by Mr. H. H. Aylesworth, the newly elected president of the National Broadcasting Company, sponsors of the program. In a five minute talk Mr. Aylesworth told of what the new company was attempting to do in its work as a program maker.

"We are attempting in this evening presentation to give you just a glimpse of the goal we will strive to reach in the making up of programs under our supervision," he said.

In addition to Miss Garden, Mr. Rogers and Weber and Fields, the following artists and musical organizations participated: Titta Ruffo, baritone of the Metropolitan Opera Company; Harold Bauer, pianist who was engaged while in Europe and found it necessary to advance his sailing date to arrive in time for the broadcast; the New York Symphony Orchestra, Walter Damrosch conducting; the New York Oratorio Society, Albert Sirois conducting; the Goldman Band, Edwin Franko Goldman conducting; an Operatic Sextette, direction of Cesare Sodero and consisting of Mesdames Greta Zelenka and Devora Nadworney and Giuseppe di Benedetto; Mito Picco, Justo Lauric and Nino Rudi, all artists well known to a large radio audience; a light opera company also under the direction of Mr. Sodero and composed of Mesdames Adèle Parkhurst and Frances Pasette and Messrs. Charles Owen, Louis Lawrie, Theodore Webb and Jack Oakley; Vincent Lopez, George Olsen, Ben

Berlin and B. A. Rolfe and their respective orchestras.

Stations in Chain

The following broadcasting stations participated in the simultaneous transmission of the program in addition to WEAF and WJZ in New York City: WEEI, Boston; WJAK, Providence; WBZ, Springfield (Mass.); WLAB, Worcester; WVIC, Hartford; WDRK, New Haven; WGY, Schenectady; WGLK, Buffalo; WIII, Philadelphia; WKT, Washington, D.C.; WSSH, Portland (Me.); WCAE and KDKA, Pittsburgh; WJAM, Cleveland; WSAI, Cincinnati; WWJ, Detroit; WGN and WYU, Chicago; WJAD, Milwaukee; KSD, St. Louis; WCCO, Minneapolis; St. Paul; and WDAF, Kansas City (Mo.).

One of the surprises of the evening was the display of a photograph taken of Mary Garden while she was singing in her room in the Hotel Belmont, Chicago. It was transmitted to New York City over the telephone lines of the American Telephone and Telegraph Company and flashed on the screen as a stereoscopic to the vast audience in the Waldorf before the four hour program had ended.

Advisory Board Named

Mr. Aylesworth announced the naming of the members of the Advisory Radio Council made up of representatives of various professions and phases of public life which will advise as to the best type of program from the public's point of view. The list:

Walter Damrosch, conductor, New York Symphony Orchestra.

A. F. Alderman, president, University of Virginia.

John W. Davis, lawyer.

Francis D. Farrell, president, Kansas Agricultural College.

William Green, president, American Federation of Labor.

Major General James G. Harbord, president, Radio Corporation of America.

Rev. Charles F. McFarland, general secretary, Federal Council of Churches of Christ in America.

Morgan J. O'Brien, lawyer.

Dr. Henry S. Pritchett, president, Carnegie Foundation.

Henry M. Robinson, president, First National Bank of Los Angeles.

Elihu Root, lawyer.

John Rosenwald, president, Sears Roebuck Company.

Mrs. Mary Sherman, president, General Federation of Women's Clubs.

General Guy E. Trinn, chairman of the Board, Westinghouse Electric and Manufacturing Company.

Owen D. Young, chairman of the Board, General Electric Company.

The navy's chief of operations and chief of staff of the army have also been invited to serve so that the army and navy may be in constant touch with the broad casting field and so that the broadcasting facilities may be immediately available in time of national defense.

MARY GARDEN



DAVID SARNOFF, M. H. Aylesworth of Mary Garden sent via wire from Chicago her broadcast as part of the inauguration of the new company.

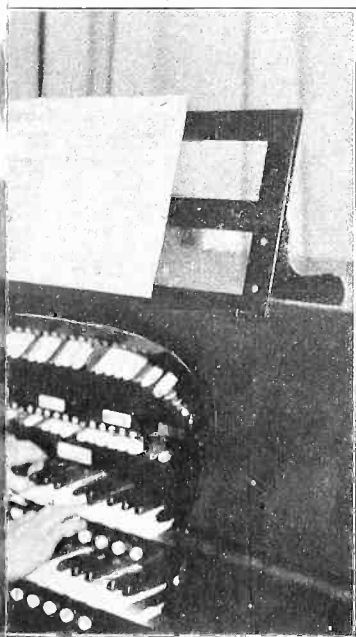


THE ORGAN is one of the most difficult the Crosley station in Cincinnati, Ohio, as perfect as possible, with the aid of a special and audio amplifier. Many prominent plumbers its wonderful tonal quality. Thousands of listeners.

PHOTO BY WIRE



Owen D. Young inspecting the photo to New York City simultaneously with program of WEAf under National Broad-management.



struments to transmit perfectly. WLW, ever, makes sure that this transmission is ally constructed studio organ shown above ts have played on this organ and come- name opinion has also been given by the who have written.

REALISM CARRIED FROM GRIDIRON

Use of Only Two Microphones Provides the Crowd Atmosphere to Enliven Things at the Listener's Home

"How do you do it? How many mikes do you use?"

Those are only two of the many questions fans are asking Hal and Harry, football announcers of WMAQ.

Hal and Harry give a lot of the credit for their successful broadcast to Walter R. Lindsay, chief operator, who, with the other operators, has worked out the present method.

"Not so long ago," explains Mr. Lindsay, "it was thought the more mikes the better broadcast. But experience shows that fewer mikes, properly placed, give better results."

"To make the game realistic for the fans attending the contest via radio, there are but two microphones. One is placed down near the band in the center of the stand and the other within the glass enclosed broadcast booth."

"A mixer panel is used so that the microphone near the band may be kept slightly open all the time to permit a continuous background of cheers and music for the play-by-play account of the game by the announcer, which comes through the second microphone within the booth."

The creation of the crowd atmosphere is a goal all stations seek.

"Radio Educates," Says Manufacturer

Radio has accomplished something that the phonograph has never been able to do, according to Herman Rose, president of the Shamrock Manufacturing Company of Newark, N. J.

"Radio has made people listen to talks and lectures, to schools and politics," he said.

"The phonograph has tried to teach via the record route, but has never been successful. It has tried to put humorous monologues and dialogues into the home, but they always seemed to stay in the music store. The record maker has learned through bitter experience that phonographs are not built for speech reproduction."

"But radio, scorned by Edison, has done all these things."

"Radio colleges today have a greater number of students than a combination of all the regular colleges. Radio pupils tune in their lessons with a regularity that would put the remittance college man to shame. Radio can and does teach."

Farming Broadcast Proves Successful

The Department of Agriculture announced that radio has definitely proved itself an effective vehicle for the diffusion of agricultural information. The announcement follows:

The radio has definitely proved to be an effective new vehicle for diffusion of the department's information. Since October 4, when the new Fall schedule of programs went on the air, the response from broadcasting stations and farm homes has been enthusiastic. Thousands of letters, an average of about 500 a day, asking for enrollment cards, bulletins, and information, have been flowing in to the Radio Service. Stations write to express their own appreciation and that of their audiences. Farmers, who ordinarily find little time or inclination for correspondence, write many letters of appreciation and commendation. That the department's programs are successfully holding their own in the competition on the dials is evidenced by the numerous letters received.

Set For All Soon, Says Werrenrath

The musical leadership of the world will pass from Europe to America within the next generation largely because of radio developments, according to Reinald Werrenrath, American baritone, who believes practically every American home will have a radio within the next five years.

"Radio is bringing the finest music to the smallest farm," he added, "and it is a natural result that children will absorb its beauty, and will grow up with a finer appreciation of beauty and culture than their parents."

This popular concert artist was the first of the internationally famous singers to broadcast in the Atwater Kent Sunday night concert.

"By popularizing the classics, the phonograph and radio have contributed immeasurably to America's musical appreciation," he added. "Just how far reaching the effect of radio will be it is impossible to predict. In fact, it is overwhelming when one considers the possibilities of it, and the breadth of its influence. I was told that some time in the future we shall heat our homes and run our automobiles by radio. I do not doubt it, for if any one had told us ten years ago that the radio could do what it is doing today, we should have derided the idea."

Professor to Tell How to Pronounce

The educational effect of broadcasting may be exaggerated in some quarters but there is little doubt that it has a tremendous educational bearing on language and the art of speaking correctly. As programs which come to listeners by radio appeal almost wholly to the ear, pronunciation and grammatical construction of sentences are factors in molding the habits of people in speaking. With this thought in mind Professor William Tilley, Ph.D., will be heard in the regular weekly series of Columbia University lectures from WEAf on Mondays at 7:10 p. m.

Professor Tilley, who will give hints on the phonetics of speech, studied under Henry Sweet of England, and Prof. W. Victor, Univ. of Marburg, Germany.

COMPLETE STATION LIST

Corrected up to November 17

COMPLETE STATION LIST

Corrected up to November 17

Station	Location	Owner	Meters	Station	Location	Owner	Meters
KDGE—Barrett, Minn.	Jaren Drug Co.	332.4	KFWU—Pineville, La.	Louisiana College	238	WABC—Asheville, N. C.	Asheville Battery Co. 254
KDKA—East Pittsburgh, Pa.	Westinghouse, house E. & M. Co.	309.1	KFWU—Portland, Ore.	Wilbur Jerman	212.6	WABI—Bangor, Me.	First Universalist Church 244
KDLR—Devils Lake, N. D.	Radio Elec. Co.	231	KFXB—Big Bear Lake, Cal.	B. C. Heller	202.6	WABO—Rochester, N. Y.	Hickson Elec. Co. Inc. 278
KDYL—Salt Lake City, Ia.	Intermountain Broadcasting Corporation	246	KFXD—Logan, Utah	Service Radio Company	205.4	WABR—Henderson, N. C.	Scott High School 263
KFAB—Lincoln, Neb.	Nebraska Buick Auto Co.	340.7	KFXH—El Paso, Tex.	Bledsoe Radio Co.	242	WABW—Waco, Tex.	The College of Western 266.8
KFAD—Phoenix, Ariz.	Elec. Equip. Co.	215.7	KFXJ—Near Edgewater, Col.	R. G. Howell	215.7	WABX—Mount Clemens, Mich.	H. B. Joy 242
KFAF—San Jose, Cal.	A. E. Fowler	217.3	KFXR—Oklahoma City, Okla.	Classen Film Finishing Co.	214.2	WABY—Philadelphia, Pa.	J. Magaldi, Jr. 242
KFAU—Boise, Idaho	Indep. Sch. Dist. of Boise	280.2	KFFX—Flagstaff, Ariz.	H. M. Costigan	205.4	WABZ—New Orleans, La.	Colis Place Baptist Church 275.1
KFBB—Havre, Mont.	F. A. Buttrey & Co.	275	KFFE—Oxnard, Cal.	Radio R. M.	214.2	WADC—Akron, O.	Allen T. Simons 258
KFBC—San Diego, Cal.	Union League Club	380	KFFJ—Portland, Tex.	Houston Chronicle Publishing Company	238	WADF—Akron, O.	Allen T. Simons 258
KFBL—Everett, Wash.	Leese Bros.	224	KFYO—Texarkana, Tex.	Buchanan-Vaughan Co.	209.7	WAGM—Royal Oak, Mich.	R. L. Miller 275
KFBS—Trinidad, Cal.	School District No. 1	374.8	KFYR—Bismark, N. D.	Hoskins-Meyer, Inc.	248	WAHG—Richmond Hill, N. Y.	A. H. Grebe 315.6
KFBW—Laramie, Wyo.	St. Matthews Cathedral	374.8	KGAR—Tucson, Ariz.	Tucson Citizen	243.8	WAGS—Somerville, Mass.	Willow Garages, Inc. 250
KFDB—Phoenix, Ariz.	Nielson Radio Supply Co.	238	KGBU—Tucson, Ariz.	Ariz. Radio Co.	227	WAGT—Taunton, Mass.	A. H. Waite & Co. 229
KFDD—Boise, Idaho	St. Michael Cathedral	275.1	KGBU—Ketchikan, Alaska	Alaska Radio and Service Company	228.9	WAIT—Columbus, O.	American Ins. Union 293.9
KFDM—Beaumont, Tex.	Magnolia Petroleum Co.	315.6	KGBW—Joplin, Mo.	Martin Brotherson	282.8	WAMP—Minneapolis, Minn.	Raddison Radio Corp. 243.8
KFDX—Shreveport, La.	First Baptist Church	236.1	KGBX—St. Joseph, Mo.	Julius B. Abercrombie	347.8	WAPI—Auburn, Ala.	Alabama Polytechnic Inst. 461.3
KFDZ—Minneapolis, Minn.	H. O. Iverson	305.9	KGBZ—York, Neb.	Federal Live Stock Remedy Co.	202.6	WARC—Medford, Mass.	American Radio & Research 261
KFEC—Portland, Ore.	Meier & Frank	252	KGCA—Decorah, Ia.	C. W. Greenlee	333.1	WARS—Brooklyn, N. Y.	Amateur Radio Specialty Co. 295
KFEL—Denver, Colo.	E. P. O'Fallon, Inc.	254.1	KGCB—Oklahoma, Okla.	Wallace Radio Inst.	331	WASH—Grand Rapids, Mich.	Baxter Launderers & Cleaners 256.3
KFEQ—Oak, Neb.	Scroggins & Co.	268	KGCG—Newark, Ark.	Moore Motor Co.	239.9	WATT—Portland-First District, Edison Electric, Ill.	243.8
KFEY—Kellogg, Idaho	Bunker Hill & Sullivan	213	KGCH—Wayne, Neb.	Wayne Hospital	450	WBBA—W. Lafayette, Ind.	Purdue University 273
KFEP—Boberly, Mo.	First Baptist Church	242	KGCI—San Antonio, Tex.	Int. Radio Co.	239.9	WBAB—Harrisburg, Pa.	Pa. State Police 275
KFEB—Moore, Ia.	Gray Hardware Co.	226	KGCM—San Antonio, Tex.	Louis Wasmser	230.6	WBAL—Baltimore, Md.	Consolidated Gas & Power Co. 245.8
KFHH—Wichita, Kan.	Kassler Bros.	287.7	KGCN—Concordia, Kans.	Alva E. Smith	210	WBAC—Baltimore, Md.	James Miliken University 270.1
KFHA—Cunison, Colo.	Western State College of Colorado	252	KGCR—Brookings, S. D.	Cutlers Broadcasting Service	252	WBAP—Fort Worth, Tex.	Arter Pub., Inc. 475.9
KFHL—Oskaloosa, Ia.	Penn. College	240	KGCX—Vida, Mont.	First State Bank	240	WBAW—Nashville, Tenn.	Braid Elec. Co. 236.1
KFII—Los Angeles, Cal.	Earl C. Anthony, Inc.	467	KGDA—Delta Rapids, S. D.	Home Auto Co.	254	WBAX—Wilkes Barre, Pa.	J. H. Stenger, Jr. 256
KFIF—Portland, Ore.	Benson Polytechnic Inst.	248	KGDJ—Cresco, Ia.	R. Kother	405.2	WBBC—Brooklyn, N. Y.	P. J. Testan 249.9
KFIO—Spokane, Wash.	North Central High School	272.6	KGDI—Seattle, Wash.	Radio Service Co.	416.3	WBBL—Richmond, Va.	Grace Covenant Presby. Church 228.9
KFIQ—Yakima, Wash.	First Methodist Church	256	KGO—Oakland, Cal.	General Electric Co.	361.2	WBBM—Chicago, Ill.	Atlas Investment 226
KFIU—Juneau, Alaska	Alaska Elec. Light & Power Co.	226	KGTT—San Francisco, Cal.	Glad Tidings Temple & Bible Inst.	206.8	WBBS—Potosi, Mich.	Potosi High School 226
KFIZ—Fond Du Lac, Wisc.	Fond Du Lac Commonwealth Reporter	278	KGU—Honolulu, T. H.	Marion A. Mulrony	270	WBBS—Potosi, Mich.	Potosi High School 226
KFJB—Marshalltown, Ia.	Marshall Electric Co.	213	KGV—Portland, Ore.	Oregonian Pub. Co.	491.5	WBBS—Potosi, Mich.	Potosi High School 226
KFJC—Junction, Mo.	H. P. Peterson	218.8	KHJ—Los Angeles, Cal.	Times Mirror Co.	405.2	WBBS—Potosi, Mich.	Potosi High School 226
KFJF—Oklahoma City, Okla.	Nat'l Radio Mfg. Co.	261	KHQ—Spokane, Wash.	Louis Wasmser	394.5	WBBS—Potosi, Mich.	Potosi High School 226
KFJJ—Astoria, Ore.	E. E. Marsh	245.8	KFLZ—Anita, Ia.	Atlantic Automobile Co.	272.6	WBBS—Potosi, Mich.	Potosi High School 226
KFJM—Grand Forks, N. D.	Univ. of N. D.	278	KJBS—San Francisco, Cal.	J. Brunton & Sons Co.	234.2	WBBS—Potosi, Mich.	Potosi High School 226
KFJR—Portland, Ore.	A. C. Dixon & Son	243	KJR—Seattle, Wash.	Northwest Radio Serv. Co.	384.4	WBBS—Potosi, Mich.	Potosi High School 226
KFJS—Fort Dodge, Ia.	Tunwall Radio Co.	266	KLDS—Independence, Mo.	Reorganized Church of Jesus Christ	440.9	WBBS—Potosi, Mich.	Potosi High School 226
KFJZ—Fort Worth, Tex.	E. Branch	254.1	KLS—Oakland, Cal.	Warner Brothers	250	WBBS—Potosi, Mich.	Potosi High School 226
KFKA—Greeley, Colo.	Colo. State Teachers Col.	431.4	KLX—Oakland, Cal.	Tribe Publishing Co.	508.2	WBBS—Potosi, Mich.	Potosi High School 226
KFKB—Miford, Kans.	J. R. Brinkley, M.D.	431.4	KLZ—Denver, Col.	Reynolds Radio Co.	265.3	WBBS—Potosi, Mich.	Potosi High School 226
KFKU—Lawrence, Kans.	Univ. of Kans.	275	KMA—Shenandoah, Ia.	May Seed & Nursery	461.3	WBBS—Potosi, Mich.	Potosi High School 226
KFKX—Hastings, Neb.	Westinghouse, E. & M. Co.	288.3	KMJ—Fresno, Cal.	The Fresno Bee	234.2	WBBS—Potosi, Mich.	Potosi High School 226
KFKZ—Kirkville, Mo.	Cham. of Com.	225.4	KMMJ—Clay Center, Neb.	M. M. Johnson Co.	228.9	WBBS—Potosi, Mich.	Potosi High School 226
KFLR—Albuquerque, N. M.	Univ. of N. M.	254	KMO—Tacoma, Wash.	KMO, Inc.	250	WBBS—Potosi, Mich.	Potosi High School 226
KFLU—San Benito, Tex.	San Benito Radio Club	236	KMP—Louis, Mo.	Voice of St. Louis	280.2	WBBS—Potosi, Mich.	Potosi High School 226
KFLV—Rockford, Ill.	Swedish Evangelist Church	229	KMX—Los Angeles, Cal.	Lechophone Co.	238	WBBS—Potosi, Mich.	Potosi High School 226
KFLX—Galveston, Tex.	Geo. Roy Clough	240	KOA—Denver, Col.	General Electric Co.	336.9	WBBS—Potosi, Mich.	Potosi High School 226
KFMR—Stout City, Ia.	Henningside College	261	KOAC—Corvallis, Ore.	Oregon Agriculture Col.	280.2	WBBS—Potosi, Mich.	Potosi High School 226
KFMX—Northfield, Minn.	Carlton College	336.9	KOB—State College, N. M.	New Mexico College of Agriculture	348.6	WBBS—Potosi, Mich.	Potosi High School 226
KFMY—Shenandoah, Ia.	Henry Field Seed Co.	461.3	KOC—Omaha, Neb.	Omaha Central H. S.	258	WBBS—Potosi, Mich.	Potosi High School 226
KFOA—Eureka, Wash.	Rhoda E. Branch	453.3	KOCW—Kichashia, Okla.	Oklahoma College for Women	252	WBBS—Potosi, Mich.	Potosi High School 226
KFOB—Burlingame, Cal.	K. F. O. B., Inc.	225.4	KOIL—Council Bluffs, Ia.	Mona Motor Co.	305.9	WBBS—Potosi, Mich.	Potosi High School 226
KFON—Long Beach, Cal.	Echophone Radio Shop	213	KOIN—Portland, Ore.	KOIN, Inc.	319	WBBS—Potosi, Mich.	Potosi High School 226
KFOO—Salt Lake City, Utah	Latter Day Saints Union	236	KOMO—Seattle, Wash.	Birt F. Fisher	305.9	WBBS—Potosi, Mich.	Potosi High School 226
KFOR—David City, Neb.	Tire & Electric Co.	226	KOWW—Walla Walla, Wash.	P. A. Moore	285	WBBS—Potosi, Mich.	Potosi High School 226
KFOT—Wichita, Kan.	College Hill Radio Club	213	KPO—San Francisco, Cal.	Hale Bros., Inc.	428.3	WBBS—Potosi, Mich.	Potosi High School 226
KFOX—Omaha, Neb.	Technical H. S.	248	KPJM—Prescott, Ariz.	Wilburn Radio Service	215	WBBS—Potosi, Mich.	Potosi High School 226
KFOY—St. Paul, Minn.	Beacon Radio Service	218	KPRC—Pasadena, Cal.	Pasadena Presbyterian Church	229	WBBS—Potosi, Mich.	Potosi High School 226
KFPL—Dublin, Tex.	C. C. Baxter	252	KPSN—Pasadena Star-News	Pasadena, Cal.	226.9	WBBS—Potosi, Mich.	Potosi High School 226
KFPM—Greenville, Tex.	New Furniture Co.	242	KQW—San Jose, Cal.	First Baptist Church	333.1	WBBS—Potosi, Mich.	Potosi High School 226
KFPR—Los Angeles, Cal.	L. A. County Forestry Department	231	KQV—Pittsburgh, Pa.	Douleday Hill Electric Company	275	WBBS—Potosi, Mich.	Potosi High School 226
KFPW—Casperville, Mo.	St. John's Methodist Episcopal Church	258	KRAC—Shreveport, La.	Caddo Radio Club	220	WBBS—Potosi, Mich.	Potosi High School 226
KFFY—Spokane, Wash.	Symons Investment Co.	272.6	KRLD—Dallas, Tex.	Dallas Radio Labs.	357.1	WBBS—Potosi, Mich.	Potosi High School 226
KFOA—St. Louis, Mo.	The Principia	245.8	KRSQ—Seattle, Wash.	Radio Sales Corp.	499.7	WBBS—Potosi, Mich.	Potosi High School 226
KQBB—Fort Worth, Tex.	Searchlight Publishing Co.	508.2	KRE—Berkeley, Cal.	Berkeley Daily Gazette	256	WBBS—Potosi, Mich.	Potosi High School 226
KFOD—Anchorage, Alaska	Anchorage Radio Club	300	KSAC—Manhattan, Kans.	Kansas State Agricultural College	340.7	WBBS—Potosi, Mich.	Potosi High School 226
KFOF—Iowa City, Ia.	G. S. Carson, Jr.	224	KSBA—Shreveport, La.	W. G. Paterson	312.6	WBBS—Potosi, Mich.	Potosi High School 226
KFOU—Holy City, Cal.	W. E. Riker	230.6	KSD—St. Louis, Mo.	Pulitzer Publishing Co.	545.1	WBBS—Potosi, Mich.	Potosi High School 226
KFQW—North Bend, Wash.	C. F. Kiermire	215.7	KSEL—Pocatello, Ida.	GSEI Broadcasting Co.	260.7	WBBS—Potosi, Mich.	Potosi High School 226
KFOZ—Hollywood, Cal.	Taft Products Co.	226	KSL—Salt Lake City, Utah	Radio Service Corp.	299.8	WBBS—Potosi, Mich.	Potosi High School 226
KFRB—Beville, Tex.	Hall Brothers	248	KSMR—Santa Maria, Cal.	Santa Maria Valley R. R.	282.8	WBBS—Potosi, Mich.	Potosi High School 226
KFRS—San Francisco, Cal.	City of Paris	268	KSO—Clarinda, Ia.	A. A. Berry Seed Co.	405.2	WBBS—Potosi, Mich.	Potosi High School 226
KFRU—Columbia, Mo.	Stephens College	499.7	KTAB—Oakland, Cal.	Ass. Broadcaster	302.8	WBBS—Potosi, Mich.	Potosi High School 226
KFRV—Olympia, Wash.	Western Bldg. Co.	218.8	KTBI—Los Angeles, Cal.	Bible Institute	293.9	WBBS—Potosi, Mich.	Potosi High School 226
KFRD—San Antonio, Tex.	Adrian Radio Corp.	245.8	KTBR—Portland, Ore.	M. E. Brown	263	WBBS—Potosi, Mich.	Potosi High School 226
KFSG—Los Angeles, Cal.	Echo Park Evangelist Association	275	KTHS—Fort Springs, Ark.	New Arlington Hotel	374.8	WBBS—Potosi, Mich.	Potosi High School 226
KFUL—Galveston, Tex.	T. Gogran & Bros.	258	KTUS—Muscatine, Ia.	Norman Baker	333.1	WBBS—Potosi, Mich.	Potosi High School 226
KFUM—Colorado Springs, Colo.	W. D. Corley	239.9	KTW—Seattle, Wash.	First Baptist Church	263	WBBS—Potosi, Mich.	Potosi High School 226
KFUO—St. Louis, Mo.	Concordia Seminary	545.1	KUOA—Fayetteville, Ark.	Univ. of Ark.	453.3	WBBS—Potosi, Mich.	Potosi High School 226
KFUP—Denver, Col.	Fitzsimons Gen. Hosp.	234	KUOM—Missoula, Mont.	University of Mont.	243.8	WBBS—Potosi, Mich.	Potosi High School 226
KFUR—Ogden, Utah	Sherman Co., Inc.	224	KUSD—Vermillion, S. D.	University of S. D.	231	WBBS—Potosi, Mich.	Potosi High School 226
KFUS—Oakland, Cal.	L. L. Sherrman	263	KUT—Austin, Tex.	University of Tex.	231	WBBS—Potosi, Mich.	Potosi High School 226
KFUT—Salt Lake City, Utah	Univ. of Utah	263	KVGO—Bristow, Okla.	SW Sales Corp.	374.8	WBBS—Potosi, Mich.	Potosi High School 226
KFUU—Orkland, Cal.	H. C. Colburn & E. L. Mathewson	220.4	KWCR—Cedar Rapids, Ia.	H. F. Parr	278	WBBS—Potosi, Mich.	Potosi High School 226
KFVJ—Venice, Cal.	C. I. McWhinnie	205.4	KWG—Stockton, Cal.	Portable Wireless Telegraph Co.	248	WBBS—Potosi, Mich.	Potosi High School 226
KFVE—St. Louis, Mo.	Venson Broadcasting Corporation	239.9	KWKC—Kansas City, Mo.	Wilson Duncan Studios	236	WBBS—Potosi, Mich.	Potosi High School 226
KFVG—Independence, Kans.	First M. E. Church	239.9	KWKH—Shreveport, La.	The W. K. Henderson Iron Works and Supply Co.	312.3	WBBS—Potosi, Mich.	Potosi High School 226
KFVI—Houston, Tex.	Headquarters Tower, 56th Calvary	240	KWSC—Pullman, Wash.	State College of Wash.	348.6	WBBS—Potosi, Mich.	Potosi High School 226
KFVN—Fairmont, Minn.	C. E. Bagley	227	KWUC—Santa Ana, Cal.	Dr. J. W. Hancock	266.7	WBBS—Potosi, Mich.	Potosi High School 226
KFVR—Denver, Col.	Moonlight Ranch	244	KWUC—Lemars, Ia.	Western Union College	252	WBBS—Potosi, Mich.	Potosi High School 226
KFVS—Cape Girardeau, Mo.	Cape Girardeau Broadcasting Station	224	KXWG—Brownsville, Tex.	City of Brownsville	278.8	WBBS—Potosi, Mich.	Potosi High School 226
KFVY—Albuquerque, N. M.	Radio Suppl. Co.	252	KYW—Chicago, Ill.	Westinghouse E. & M. Co.	535.4	WBBS—Potosi, Mich.	Potosi High School 226
KFWB—Hollywood, Cal.	Warner Bros. Pic.	252	KXRO—Seattle, Wash.	Brott Lab.	240	WBBS—Potosi, Mich.	Potosi High School 226
KFWC—San Bernardino, Cal.	L. E. Wall	291.1	KZM—Oakland, Cal.	Frederic D. Allen	240	WBBS—Potosi, Mich.	Potosi High School 226
KFWF—St. Louis, Mo.	St. Louis Truth Center	214.2	WAAD—Cincinnati, O.	Ohio Mechanical Inst.	258	WBBS—Potosi, Mich.	Potosi High School 226
KFWH—Eureka, Cal.	F. Wellington Morse, Jr.	254.1	WAAF—Chicago, Ill.	Daily Drivers Journal	277.6	WBBS—Potosi, Mich.	Potosi High School 226
KFWI—San Francisco, Cal.	Radio Entertainment	249.2	WAAB—Newark, N. J.	Isaiah R. Nelson	263	WBBS—Potosi, Mich.	Potosi High School 226
KFWM—Oakland, Cal.	Educa. Society	315.6	WAAC—Omaha, Neb.	Omaha Grain Exchange	384.4	WBBS—Potosi, Mich.	Potosi High School 226
KFWO—Avalon, Cal.	Lawrence Mott	211.1	WABH—Harrisburg, Pa.	Harrisburg Radio Co.	204	WBBS—Potosi, Mich.	Potosi High School 226

Station	Location	Owner	Meters	Station	Location	Owner	Meters	Station	Location	Owner	Meters
WEAM—North Plainfield, N. J., Borough of North Plainfield			261	WJAG—Norfolk, Neb., Norfolk Daily News			352.7	WOAN—Lawrenceburg, Tenn., J. D. Vaughn			282.8
WEAN—Providence, R. I., The Shepard Co.			367	WJAK—Kokomo, Ind., Kokomo Tribune			254.1	WOAW—Omaha, Neb., Woodmen of the World			526
WEAO—Columbus, O., Ohio State University			293.9	WJAM—Cedar Rapids, Ia., D. M. Latham			268	WOAX—Trenton, N. J., F. J. Wood			240
WEAR—Cleveland, O., Willard Storage Battery Company			389.4	WJAP—Providence, R. I., The Outlet Co.			305.9	WOBB—Chicago, Ill., Longene Engrg. Constr. Co.			555.2
WEAU—Sioux City, Ia., Davidson Bros. Co.			275	WJAS—Pittsburgh, Pa., Pittsburgh Radio Supply House			375	WOC—Davenport, Ia., Palmer School of Chiropractic			483.6
WEBC—Superior, Wisc., W. C. Bridges			242	WJAX—Jacksonville, Fla., City of Jacksonville			336.9	WOCB—Orlando, Bldg. Co., Orlando, Fla.			293.7
WEBH—Chicago, Ill., Edgewater Beach Hotel			370.2	WJAZ—Mount Prospect, Ill., Zenith Radio Corp.			326.4	WOCL—Jamestown, N. Y., A. B. Newton			275.1
WEBJ—New York, N. Y., Third Ave. R. R. Co.			273	WJBA—Joliet, Ill., D. H. Leutz, Jr.			402.8	WODA—Patterson, N. J., O'Dea Temple of Music			390.9
WEBL—Portland, R. C., A. J. Show			226	WJBC—St. Petersburg, Fla., J. L. Crockett			254.1	WOL—Ames, Ia., Iowa State College			270
WEBQ—Harrisburgh, Ill., Tate Radio Co.			226	WJBI—Red Bank, N. J., R. S. Johnson			218.8	WOK—Homewood, Ill., Neurofound Radio Mfg. Co.			217.3
WEBR—Buffalo, N. Y., H. H. Howell			244	WJBR—New Orleans, La., J. Jensen			327.7	WOMT—Manitowish, Wisc., Mikado Theatre			254.1
WEBW—Beloit, Wisc., Beloit College			258	WJBW—Lewistown, Pa., Bucknell University			211.1	WOM—Philadelphia, Pa., J. Wanmaker			508.2
WEBZ—Savannah, Ga., Savannah Radio Corp.			263	WJBW—Woodhaven, N. Y., Union Course Club			288.3	WOOD—Grand Rapids, Mich., Grand Radio Co.			241.8
WEDC—Chicago, Ill., Emil Denmark Co.			422.3	WJBW—New Orleans, La., C. Carlson, Jr.			270.1	WOQ—Kansas City, Mo., Unity School			278
WEEI—Boston, Mass., Edison Electric Ill. Co.			348.6	WJBX—Osterville, Mass., Henderson & Ross			280	WOR—Newark, N. J., L. Hamberger & Co.			405.2
WEHS—Chicago, Ill., O. G. Fordham			202.6	WJBY—Gadsden, Ala., Elec. Construction Co.			260	WORD—Batavia, Ill., Peoples Pulpit Association			275
WEMC—Berrien Springs, Mich., Emanuel Miss. College			315.6	WJJD—Moosehart, Ill., Loyal Order of Moose			370.2	WOS—Jefferson City, Mo., State Marketing Bureau			440.9
WENR—Chicago, Ill., All-American Radio Corp.			266	WJR—Pontiac, Mich., Jewett Radio & Phonograph Co. and The Detroit Free Press			516.9	WOWO—Fort Wayne, Ind., Main Automobile Supply Co.			227
WEW—St. Louis, Mo., St. Louis University			360	WJWJ—New York, N. Y., Nat. Broadcasting Co.			516.9	WPAC—Agricultural College, N. D., N. D. Agricultural College			275
WFAA—Dallas, Tex., Dallas News & Dallas Journal			475.9	WJY—New York, N. Y., Nat. Broadcasting Co. of America			406.2	WPAP—Cliffside, N. J., (See WQAO)			361.2
WFAM—St. Cloud, Minn., Times Publishing Co.			273	WJZ—Bound Brook, N. J., Nat. Bldg. Co. of Amer.			454.3	WPCB—Chicago, Ill., North Shore Congregational Church			258
WFAV—Lincoln, Neb., University of Neb.			250	WKAF—Milwaukee, Wisc., WKAF Broadcasting Corp.			261	WPCH—N. Y. C., N. Y., Concourse Radio Corp.			273
WFBC—Knoxville, Tenn., First Baptist Church			250	WKAQ—San Juan, P. R., Radio Corporation of Porto Rico			340.7	WPQ—Buffalo, N. Y., Hiram L. Turner			205.4
WFBE—Cinc., O., Garfield Place Hotel			232.4	WKAR—East Lansing, Mich., Michigan State College			285.8	WPG—Atlantic City, N. J., Municipality of Atlantic City			279.8
WFBI—Columbus, O., W. F. Gable Co.			278	WKAY—Lancaster, Pa., Arrow Radio Club			213.7	WPRC—Harrisburg, Pa., Wilson Printing & Radio Co.			215.7
WFBJ—Collegeville, Minn., St. John's University			236	WKBA—Chicago, Ill., Arrow Battery Co.			209.7	WPSC—State College, Pa., Pa. State College			261
WFBF—Syracuse, N. Y., Onondaga Hotel			252	WKBB—Joliet, Ill., Sanders Brothers			282.8	WQAA—Parkerburg, Pa., H. A. Beale, Jr.			230
WFBH—Indianapolis, Ind., Merchant H. L. Co.			368	WKBC—Birmingham, Ala., H. L. Ansley			235	WQAC—Amarillo, Tex., Gish Radio Service			234
WFBH—Baltimore, Md., Fifth Infantry, National Guard			254	WKBD—Jersey City, N. J., F. V. Bremer			235	WQAE—Springfield, Vt., Moore Radio News Station			246
WFBZ—Galesburg, Ill., Knox College			254	WKBE—Webster, Mass., K. & B. Electric Co.			270.1	WQAM—Miami, Fla., Electrical Equipment Co.			285.5
WFCI—Pawtucket, R. I., Frank Crook, Inc.			229	WKBF—Indianapolis, Ind., N. D. Watson			241	WQAN—Scranton, Pa., Scranton Times			250
WFDF—Fint, Mich., Frank D. allain			234	WKBG—Portland, Me., L. Carroll			217	WQAO—Cliffside, N. J., Calvary Baptist Church			244
WFL—Philadelphia, Pa., Strawbridge & Clothier			394.5	WKBK—Portland, Me., L. Carroll			217	WQAP—Buffalo, N. Y., Hiram L. Turner			205.4
WFLC—Chicago, Ill., Vesta Battery Co.			217.3	WKBB—Chicago, Ill., F. L. Schoenwolf			220.4	WQJ—Chicago, Ill., Calumet Co.			447.5
WFLR—Brooklyn, N. Y., R. M. Lacey			305.4	WKBJ—St. Petersburg, Fla., Gospel Tabernacle, Inc.			280	WRAF—Lafayette, Ind., Radio Club, Inc.			224
WGAL—Lancaster, Pa., Lancaster Electric Supply and Construction Co.			248	WKBL—Monroe, Mich., Monroa Radio Mfg. Co.			352	WRAH—Providence, R. I., Stanley N. J. Neal			235
WGCB—Freeport, N. Y., H. H. Carman			243.8	WKBM—Youngstown, O., Radio Elec. Serv. Co.			312.6	WRAM—Galesburg, Ill., Lombard College			244
WGCB—Memphis, Tenn., First Baptist Church			278	WKBN—Jersey City, N. J., Smith Corp.			309.1	WRBW—Reading, Pa., Avenue Radio & Electric Shop			238
WGCS—Evanville, Ind., Finke Furniture Co.			216.1	WKBO—New York City, Starlight Amusement Park			285	WRBC—Valparaiso, Ind., Immanuel Lutheran Church			278
WGCR—Scranton, Pa., Scranton Bldg. Inc.			389.9	WKBR—Auburn, N. Y., Chas. J. Hesler			256.3	WRCC—Washington, D. C., Nat. Bldg. Co. of Amer.			468.5
WGCS—Astoria, La., N. Y., Gimbel Bros.			315.6	WKRS—Galesburg, Ill., P. N. Nelson			361.2	WRCC—Raleigh, N. C., Wayne Radio Co.			252
WGBU—Fulford-by-the-Sea, Fla., Florida Cities Finance Company			278	WKBT—New Orleans, La., 1st Baptist Church			249	WREC—Coldwater, Miss., Wooten's Radio Shop			254
WCBX—Oreano, Me., University of Me.			234.2	WKBY—Brookville, Ind., Knox Battery & Electric			236.1	WREO—Lansing, Mich., Reo Motor Car Co.			225.5
WGCY—Newark, N. J., May Radio Bldg. Corp.			252	WKBY—Danville, Pa., (Portable) F. Quirk			220	WRES—Wollaston, Mass., H. L. Sawyer			300
WGCS—Chicago, Ill., Oak Leaves Broadcasting Corporation			315.6	WKBB—Buffalo, N. Y., William E. Quinn			262	WRHF—Washington, D. C., Washington Radio Hospital Fund			256
WGBH—Clearwater, Fla., Fort Harrison Hotel			265.3	WKBD—Ludington, Mich., K. L. Ashbacher			230.5	WRHM—Minneapolis, Minn., Rosedale Hospital			252
WGHP—Detroit, Mich., G. H. Phelps, Inc.			270	WKDR—Kenosha, Wisc., E. A. Dato			428.3	WRK—Hamilton, O., Doron Brothers Electric Co.			270
WGM—Jeanette, Pa., Verne & Elton Spencer			372	WKJC—Lancaster, Pa., Kirk Johnson & Co.			258.5	WRM—Urbana, Ill., University of Ill.			272
WGMU—Portland, N. Y., A. H. Grebe & Co.			236	WKRC—Cincinnati, O., The Kodel Radio Corp.			423.3	WRMU—Motor Yacht "MU-1," A. H. Grebe & Co.			236
WGN—Chicago, Ill., Chicago Tribune			302.8	WKY—Oklahoma City, Okla., R. C. Hull & N. S. Richards			275	WRNY—N. Y. C., Experim. Publishing Co.			373.8
WGR—Buffalo, N. Y., Federal Tel. & Tel. Co.			319	WLAL—Tulsa, Okla., First Christian Church			230	WRR—Dallas, Tex., City of Dallas			246
WGST—Atlanta, Ga., School of Tech.			270	WLB—Minneapolis, Minn., University of Minnesota			278	WRST—Bay Shore, N. Y., Radiated Manufacturing Co., Inc.			215.7
WGW—Milwaukee, Wisc., Radiocast Corp. of Wisc.			384.4	WLBC—Minneapolis, Minn., D. A. Burton			223.7	WRVA—Richmond, Va., Larus & Bro. Co., Inc.			256
WGY—Schenectady, N. Y., G. E. Co.			379.5	WLBE—Bklyn, N. Y., J. H. Fruitman			230.6	WSAI—Cincinnati, O., United States Playing Card Co.			325.9
WHA—Madison, Wisc., University of Wisc.			535.4	WLBI—Stevens Point, Wisc., Wisc. Department of Markets			278	WSAJ—Grove City, Pa., Grove City College			229
WHAD—Milwaukee, Wisc., Marquette Univ.			275	WLBI—Elgin, Ill., Elgin Weekly			368.8	WSAN—Allentown, Pa., Allentown Call Publishing Co., Inc.			229
WHAM—Rochester, N. Y., Eastman School of Music			273	WLIT—Philadelphia, Pa., Lit Brothers			394.5	WSAR—Fall River, Mass., Doughty & Welch Electric Co.			254.1
WHAP—New York, N. Y., Wm. H. Taylor Finance Corp.			431	WLS—Cret, Ill., Sears Roebuck Co.			344.5	WSAY—Houston, Tex., Clifford W. Vick			247.8
WHAR—Atlantic City, N. J., F. D. Cooks Sons			275	WLSL—Cranston, R. I., The Lincoln Studios, Inc.			440.9	WSAX—Chicago, Ill., Zenith Radio Corporation			248
WHAS—Louisville, Ky., Courier Journal & Louisville Times			399.8	WLTS—Chicago, Ill., Lane Technical High School			258	WSB—Pomerooy, O., Chas. Electric Shop			244
WHAZ—Troy, N. Y., Rensselaer Polytechnic Inst.			379.5	WLWL—N. A. C., Paul W. Fatters			422.4	WSB—Atlanta, Ga., Atlanta Compt. Co.			283.3
WHB—Kansas City, Mo., Sweeney School Co.			365.6	WMAC—Cazenovia, N. Y., C. B. Meredith			275	WSBC—Chicago, Ill., World Battery Co.			283.3
WHBA—Old City, Pa., C. A. Shaffer			250	WMAC—Dartmouth, Mass., Round Hills Radio Corp.			409.9	WSBF—St. Louis, Mo., Stix Baer & Fuller			273
WHBC—Canton, O., R. E. Graham			254	WMAL—Lockport, N. Y., Norton Laboratories			266	WSBT—South Bend, Ind., South Bend Tribune			315
WHBD—Bellefontaine, O., Chambers Com.			222.1	WMAL—Washington, D. C., M. A. Leese Optical Co.			212.6	WSDA—N. Y. C., Seventh Day Adventist Ch.			263
WHBF—Rock Island, Ill., Beardsley Sp. Co.			222	WMAN—Columbus, O., Haskett Radio Station			278	WSK—Bay City, Mich., World's Star Knitting Co.			261
WHBG—Harrisburg, Pa., John S. Skane			231	WMAN—Chicago, Ill., Chicago Daily News			447.5	WSM—Nashville, Tenn., National Life & Accident Insurance Co.			282.8
WHBI—Portland, Ninth District, C. L. Carrell			215	WMAY—St. Louis, Mo., Kings Highway Fresh. Church			243	WSMZ—New Orleans, La., Sangser Amusement Co. & Maison Blanche Co.			319
WHBM—Portland, Ninth District, C. L. Carrell			215.7	WMAZ—Macon, Ga., Mercer University			261	WSMH—Owosso, Mich., Shattuck Music House			240
WHBN—St. Petersburg, Fla., First Avenue M. E. Church			238	WMBB—Chicago, Ill., American Bond & Mortgage Co.			250	WSMK—Dayton, O., S. M. K. Radio Corp.			275
WHBP—Johnstown, Pa., Johnstown Auto Co.			238	WMBC—Detroit, Mich., Michigan Broadcasting Co., Inc.			236	WSOE—Milwaukee, Wisc., School of Engineering of Milwaukee			246
WHBO—Memphis, Tenn., St. Johns M. E. Ch.			233	WMBS—Miami Beach, Fla., Fleetwood Hotel Corp.			384.4	WSRO—Hamilton, O., H. W. Fahlander			252
WHBU—Anderson, Ind., Riviera Theatre & Bings Clothing			218.8	WMBI—Chicago, Ill., Moody Bible Institute			288.3	WSSH—Boston, Mass., Tremont Temple Baptist Church			260.7
WHBW—Philadelphia, Pa., D. R. Kienzie			215.7	WMC—Memphis, Tenn., Commercial Publishing Co.			499.7	WSUI—Low City, Iowa, State University of Ia.			483.6
WHBY—West De Pere, Wisc., St. Norberts College			249.9	WMCA—Hoboken, N. J., Greely Square Hotel			340.7	WSVS—Buffalo, N. Y., Seneca Vocational Sch.			218.8
WHDI—Minneapolis, Minn., W. H. Dunwoody Institute			278	WMRA—Jamaica, N. Y., Peter J. Prinz			277.1	WSWB—Batavia, Ill., R. Harris & Co.			275.1
WHEC—Rochester, N. Y., Hickson Electric Co., Inc.			258	WMSC—N. Y. C., Madison Square Garden Broadcasting Corp.			302.8	WTAD—Fall River, Mass., Fall River Daily			266
WHFC—Chicago, Ill., Hotel Flanders			285.5	WNAB—Boston, Mass., Shepard Stores			280.2	WTAE—Carthage, Ill., Tenn. Compt. Co.			236
WHK—Cleveland, O., Radio Air Service Corp.			272.6	WNAC—Boston, Mass., Shepard Stores			430.1	WTAG—Worcester, Mass., Worcester Telegram			545.1
WHN—New York, N. Y., Geo. Schubel			361.2	WNAL—Norman, Okla., University of Okla.			254	WTAL—Toledo, O., Toledo Radio & Electric Co.			252
WHO—Des Moines, Ia., Bankers Life Co.			526	WNAL—Omaha, Neb., Omaha Central High School			258	WTAM—Cleveland, O., Willard Storage Battery Co.			389.4
WHOG—Huntington, Ind., Huntington Bldg. Association			241.8	WNAT—Philadelphia, Pa., Lennig Brothers Co.			250	WTAP—Norfolk, Va., Reliance Electric Co.			261
WHT—Deerfield, Ill., Radiophone Bldg. Corp.			399.8	WNAX—Yankton, S. D., Dakota Radio Apparatus Co.			244	WTAW—College Station, Tex., Agricultural & Mechanical College of Texas			270
WIAD—Philadelphia, Pa., Howard R. Miller			250	WNBH—New Bedford, Mass., New Bedford Hotel			247.8	WTAX—Streator, Ill., Williams Hardware Co.			231
WIAS—Burlington, Ia., Home Electric			254	WNJ—Newark, N. J., Radio Shop of Newark			252	WTAZ—Lambertville, N. J., Thomas J. McGuire			261
WIBA—Madison, Wisc., Capital Times-Strand Theatre			236.1	WNK—Knoxville, Tenn., Peoples Tel. & Tel. Co.			267.7	WTIC—Hartford, Conn., Travelers Insurance Co.			475.9
WIBC—Elkins Park, Pa., St. Paul's Protestant Episcopal Church			222	WNLC—Greensboro, N. C., W. M. Nelson			233.7	WTRC—Chicago, C. 2nd Dist. Re. Club			239.9
WIBH—New Bedford, Mass., Edit Radio Stores			209.7	WNOC—New York, N. Y., Department of Plants & Structures			526	WWAE—Plainfield, Ill., Electric Park			384.4
WIBI—Flushing, L. I., N. Y., F. B. Zittel, Jr.			218.8	WOAI—San Antonio, Tex., Sou. Equip. Co.			394.5	WWJ—Detroit, Mich., Evening News Association (Detroit News)			352.7
WIBJ—Portland, Ill., C. L. Carrell			215.7					WWL—New Orleans, La., Loyola University			275
WIBM—Portland, Ill., B. Maine			215.7					WWRL—Woodside, N. Y., Woodside Radio Laboratories			258.5
WIBO—Chicago, Ill., Nelson Brothers			226								
WIBR—Weirton, W. Va., Thurman A. Owings			246								
WIBS—Elizabeth, N. J., Phos. F. Hunter			202.6								
WIBU—Poynette, Wisc., The Electric Farm			222								
WIBW—Logansport, Ind., Dr. L. L. Dill			220								
WIBX—Union, N. Y., WIBX, Inc.			205.4								
WICC—Bridgeport, Conn., Bridgeport Bldg. Sta.			285								
WIEZ—Montgomery, Ala., A. D. Trum			273								
WIL—St. Louis Mo., Benson Radio Co.			273								
WIP—Miami, Fla., Can. G. Fisher Co.			247.8								
WIP—Philadelphia, Pa., Gimbel Bros.			508.2								
WJAD—Waco, Tex., Jackson's Radio Engineering Laboratories			352.7								
WJAF—Ferndale, Mich., J. S. Fernberg Radio Co.			407								

TELEPHONE TOUR IS WEAF'S STUNT

Mary Garden at Chicago, and Will Rogers, at Independence, Kan., Heard at Celebration of New Ownership—24 Stations Transmit Event

Radio listeners throughout a greater part of the United States heard Mary Garden, Will Rogers, Weber and Fields and a host of other noted artists and musical organizations in a four-hour radio program marking the formal bow of the National Broadcasting Company, the new owners of WEAF. The program was broadcast simultaneously by twenty-two stations linked with WEAF and WJZ in New York City. The majority of the program was presented before a microphone installed in the grand ballroom of the Hotel Waldorf-Astoria in New York City, where more than 1,000 guests made up a visible audience.

A remarkable demonstration of the use of telephone lines as an adjunct for broadcasting was displayed when, without interruption of the program, the announcer at the Waldorf introduced Mary Garden. She was standing before a microphone in her apartment studio in the Hotel Belmont, Chicago. Miss Garden immediately began her program, several soprano solos, and was heard by the audience in the Waldorf in addition to those listening into receivers.

Rogers Is Heard

Later the same demonstration was witnessed when Mr. Rogers was introduced from New York and replied with a fifteen minute program from his dressing room in Memorial Hall, Independence, Kan., where he was appearing at a show.

The broadcast was opened at 8 p.m., New York time, with an address by Merlin Hall Aylesworth, the newly elected president of the National Broadcasting Company, sponsors of the program. In a five minute talk Mr. Aylesworth told of what the new company was attempting to do in its work as a program maker.

"We are attempting, in this evening's presentation, to give you just a glimpse of the goal we will strive to reach in the make-up of programs under our supervision," he said.

In addition to Miss Garden, Mr. Rogers and Weber and Fields, the following artists and musical organizations participated: Titta Ruffo, baritone of the Metropolitan Opera Company; Harold Bauer, pianist, who was engaged while in Europe and found it necessary to advance his sailing date to arrive in time for the broadcast; the New York Symphony Orchestra, Walter Damrosch conducting; the New York Oratorio Society, Albert Stoessel conducting; the Goldman Band, Edwin Franko Goldman conducting; an Operatic Sextette, direction of Cesare Sodero, and consisting of Mesdames Genia Zielinska and Devora Nadworney and Guiseppe di Benedetto, Milo Picco, Justin Lawrie and Nino Ruisi, all artists well known to a large radio audience; a light opera company, also under the direction of Mr. Sodero, and composed of Mesdames Adele Parkhurst and Frances Paperte and George Obrien, Justin Lawrie, Theodore Webb and Jack Oakley; Vincent Lopez, George Olsen, Ben

Bernie and B. A. Rolie and their respective orchestras.

Stations in Chain

The following broadcasting stations participated in the simultaneous transmission of the program in addition to WEAF and WJZ in New York City, WEEL, Boston; WJAR, Providence; WBZ, Springfield, (Mass.); WTAG, Worcester; WITC, Hartford; WDRC, New Haven; WGY, Schenectady; WGR, Buffalo; WLIT, Philadelphia; WRC, Washington, (D.C.); WCSH, Portland (Me.); WCAE and KDKA, Pittsburgh; WTAM, Cleveland; WSAI, Cincinnati; WWJ, Detroit; WGN and KYW, Chicago; WHAD, Milwaukee; KSD, St. Louis; WCCO, Minneapolis; St. Paul, and WDAF, Kansas City (Mo.).

One of the surprises of the evening was the display of a photograph taken of Mary Garden while she was singing in her room in the Hotel Belmont, Chicago. It was transmitted to New York City over the telephone lines of the American Telephone and Telegraph Company and flashed on the screen as a stereopticon to the visible audience in the Waldorf before the four-hour program had ended.

Advisory Board Named

Mr. Aylesworth announced the names of the members of the Advisory Radio Council, made up of representatives of various professions and phases in public life, which will advise as to the best type of program from the public's point of view. The list:

Walter Damrosch, conductor New York Symphony Orchestra

A. E. Alderman, president University of Virginia

John W. Davis, lawyer

Francis D. Farrell, president Kansas Agricultural College

William Green, president American Federation of Labor

Major General James G. Harbord, president Radio Corporation of America

Rev. Charles F. McFarland, general secretary Federal Council of Churches of Christ in America

Morgan J. O'Brien, lawyer

Dr. Henry S. Pritchett, president Carnegie Foundation

Henry M. Robinson, president First National Bank of Los Angeles

Elihu Root, lawyer

Julius Rosenwald, president Sears-Roebuck Company

Mrs. Mary Sherman, president General Federation of Women's Clubs

General Guy E. Trippe, chairman of the Board Westinghouse Electric and Manufacturing Company

Owen D. Young, chairman of the Board, General Electric Company

The navy's chief of operations and chief of staff of the army have also been invited to serve so that the army and navy may be in constant touch with the broadcasting field, and so that the broadcasting facilities may be immediately available in time of national defense.

MARY GARDEN



DAVID SARNOFF, M. H. Aylesworth of Mary Garden sent via wire from Chicago her broadcast as part of the inauguration of the new broadcasting company.

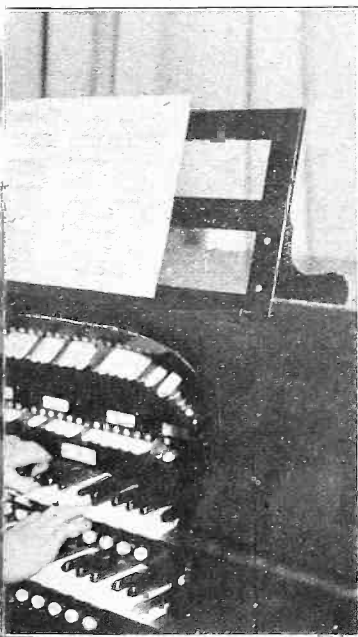


THE ORGAN is one of the most difficult the Crosley station in Cincinnati, Ohio, as perfect as possible, with the aid of a and audio amplifier. Many prominent plimented its wonderful tonal quality, thousands of listeners.

PHOTO BY WIRE



Owen D. Young inspecting the photo to New York City simultaneously with program of WEAf under National Broad- management.



instruments to transmit perfectly. WLW, ever, makes sure that this transmission is ally constructed studio organ shown above ts have played on this organ and com- same opinion has also been given by the n who have written.

REALISM CARRIED FROM GRIDIRON

Use of Only Two Microphones Provides the Crowd Atmosphere to Enliven Things at the Listener's Home

"How do you do it? How many mikes do you use?"

Those are only two of the many questions fans are asking Hal and Harry, football announcers of WMAQ.

Hal and Harry give a lot of the credit for their successful broadcast to Walter R. Lindsay, chief operator, who, with the other operators, has worked out the present method.

"Not so long ago," explains Mr. Lindsay, "it was thought the more mikes the better broadcast. But experience shows that fewer mikes, properly placed, give better results."

"To make the game realistic for the fans attending the contest via radio, there are but two microphones. One is placed down near the band in the center of the stand and the other within the glass enclosed broadcast booth."

"A mixer panel is used so that the microphone near the band may be kept slightly open all the time to permit a continuous background of cheers and music for the play-by-play account of the game by the announcer, which comes through the second microphone within the booth."

The creation of the crowd atmosphere is a goal all stations seek.

"Radio Educates," Says Manufacturer

Radio has accomplished something that the phonograph has never been able to do, according to Herman Rose, president of the Shamrock Manufacturing Company of Newark, N. J.

"Radio has made people listen to talks and lectures, to schools and politics," he said.

"The phonograph has tried to teach via the record route, but has never been successful. It has tried to put humorous monologues and dialogues into the home, but they always seemed to stay in the music store. The record maker has learned through bitter experience that phonographs are not built for speech reproduction."

"But radio, scorned by Edison, has done all these things."

"Radio colleges today have a greater number of students than a combination of all the regular colleges. Radio pupils tune in their lessons with a regularity that would put the remittance college man to shame. Radio can and does teach."

Farming Broadcast Proves Successful

The Department of Agriculture announced that radio has definitely proved itself an effective vehicle for the diffusion of agricultural information. The announcement follows:

The radio has definitely proved to be an effective new vehicle for diffusion of the department's information. Since October 4, when the new Fall schedule of programs went on the air, the response from broadcasting stations and farm homes has been enthusiastic. Thousands of letters, an average of about 500 a day, asking for enrollment cards, bulletins, and information, have been flowing in to the Radio Service. Stations write to express their own appreciation and that of their audiences. Farmers, who ordinarily find little time or inclination for correspondence, write many letters of appreciation and commendation. That the department's programs are successfully holding their own in the competition on the dials is evidenced by the numerous letters received.

Set For All Soon, Says Werrenrath

The musical leadership of the world will pass from Europe to America within the next generation largely because of radio developments, according to Reinald Werrenrath, American baritone, who believes practically every American home will have a radio within the next five years.

"Radio is bringing the finest music to the smallest farm," he added, "and it is a natural result that children will absorb its beauty, and will grow up with a finer appreciation of beauty and culture than their parents."

This popular concert artist was the first of the internationally famous singers to broadcast in the Atwater Kent Sunday night concert.

"By popularizing the classics, the phonograph and radio have contributed immeasurably to America's musical appreciation," he added. "Just how far reaching the effect of radio will be it is impossible to predict. In fact, it is overwhelming when one considers the possibilities of it, and the breadth of its influence. I was told that some time in the future we shall heat our homes and run our automobiles by radio. I do not doubt it, for if any one had told us ten years ago that the radio could do what it is doing today, we should have derided the idea."

Professor to Tell How to Pronounce

The educational effect of broadcasting may be exaggerated in some quarters but there is little doubt that it has a tremendous educational bearing on language and the art of speaking correctly. As programs which come to listeners by radio appeal almost wholly to the ear, pronunciation and grammatical construction of sentences are factors in molding the habits of people in speaking. With this thought in mind Professor William Tilley, Ph.D., will be heard in the regular weekly series of Columbia University lectures from WEAf on Mondays at 7:10 p. m.

Professor Tilley, who will give hints on the phonetics of speech, studied under Henry Sweet of England, and Prof. W. Viëtor, Univ. of Marburg, Germany.

TELEPHONE TOUR IS WEAF'S STUNT

Mary Garden at Chicago, and Will Rogers, at Independence, Kan., Heard at Celebration of New Ownership—24 Stations Transmit Event

Radio listeners throughout a greater part of the United States heard Mary Garden, Will Rogers, Weber and Fields and a host of other noted artists and musical organizations in a four-hour radio program marking the formal bow of the National Broadcasting Company, the new owners of WEAF. The program was broadcast simultaneously by twenty-two stations linked with WEAF and WJZ in New York City. The majority of the program was presented before a microphone installed in the grand ballroom of the Hotel Waldorf-Astoria in New York City, where more than 1,000 guests made up a visible audience.

A remarkable demonstration of the use of telephone lines as an adjunct for broadcasting was displayed when, without interruption of the program, the announcer at the Waldorf introduced Mary Garden. She was standing before a microphone in her apartment studio in the Hotel Belmont, Chicago. Miss Garden immediately began her program, several soprano solos, and was heard by the audience in the Waldorf in addition to those listening into receivers.

Rogers Is Heard

Later the same demonstration was witnessed when Mr. Rogers was introduced from New York and replied with a fifteen minute program from his dressing room in Memorial Hall, Independence, Kan., where he was appearing at a show.

The broadcast was opened at 8 p.m., New York time, with an address by Merlin Hall Aylesworth, the newly elected president of the National Broadcasting Company, sponsors of the program. In a five minute talk Mr. Aylesworth told of what the new company was attempting to do in its work as a program maker.

"We are attempting, in this evening's presentation, to give you just a glimpse of the goal we will strive to reach in the make-up of programs under our supervision," he said.

In addition to Miss Garden, Mr. Rogers and Weber and Fields, the following artists and musical organizations participated: Titta Ruffo, baritone of the Metropolitan Opera Company; Harold Bauer, pianist, who was engaged while in Europe and found it necessary to advance his sailing date to arrive in time for the broadcast; the New York Symphony Orchestra, Walter Damrosch conducting; the New York Oratorio Society, Albert Stoessel conducting; the Goldman Band, Edwin Franko Goldman conducting; an Operatic Sextette, direction of Cesare Sodero, and consisting of Mesdames Genia Zielinska and Devora Nadworney and Guiseppe di Benedetto, Milo Picco, Justin Lawrie and Nino Ruisi, all artists well known to a large radio audience; a light opera company, also under the direction of Mr. Sodero, and composed of Mesdames Adele Parkhurst, and Frances Paperte and George Obrien, Justin Lawrie, Theodore Webb and Jack Oakley; Vincent Lopez, George Olsen, Ben

Bernie and B. A. Rolfe and their respective orchestras.

Stations In Chain

The following broadcasting stations participated in the simultaneous transmission of the program in addition to WEAF and WJZ in New York City; WEEL, Boston; WJAR, Providence; WBZ, Springfield, (Mass.); WTAG, Worcester; WTIC, Hartford; WDRG, New Haven; WGY, Schenectady; WGR, Buffalo; WLIT, Philadelphia; WRC, Washington, (D.C.); WCSH, Portland (Me.); WCAE and KDKA, Pittsburgh; WTAM, Cleveland; WSAI, Cincinnati; WWJ, Detroit; WGN and KYW, Chicago; WHAD, Milwaukee; KSD, St. Louis; WCCO, Minneapolis-St. Paul, and WDAF, Kansas City (Mo.).

One of the surprises of the evening was the display of a photograph taken of Mary Garden while she was singing in her room in the Hotel Belmont, Chicago. It was transmitted to New York City over the telephone lines of the American Telephone and Telegraph Company and flashed on the screen as a stereopticon to the visible audience in the Waldorf before the four-hour program had ended.

Advisory Board Named

Mr. Aylesworth announced the names of the members of the Advisory Radio Council, made up of representatives of various professions and phases in public life, which will advise as to the best type of program from the public's point of view. The list:

Walter Damrosch, conductor New York Symphony Orchestra.

A. E. Alderman, president University of Virginia.

John W. Davis, lawyer.

Francis D. Farrell, president Kansas Agricultural College.

William Green, president American Federation of Labor.

Major General James G. Harbord, president Radio Corporation of America.

Rev. Charles F. McFarland, general secretary Federal Council of Churches of Christ in America.

Morgan J. O'Brien, lawyer.

Dr. Henry S. Pritchett, president Carnegie Foundation.

Henry M. Robinson, president First National Bank of Los Angeles.

Elihu Root, lawyer.

Julius Rosenwald, president Sears-Roebuck Company.

Mrs. Mary Sherman, president General Federation of Women's Clubs.

General Guy E. Trippe, chairman of the Board, Westinghouse Electric and Manufacturing Company.

Owen D. Young, chairman of the Board, General Electric Company.

The navy's chief of operations and chief of staff of the army have also been invited to serve so that the army and navy may be in constant touch with the broadcasting field, and so that the broadcasting facilities may be immediately available in time of national defense.

MARY GARDEN



(F. to Topies)
DAVID SARNOFF, M. H. Aylesworth of Mary Garden sent via wire from Chicago her broadcast as part of the inaugural casting Com

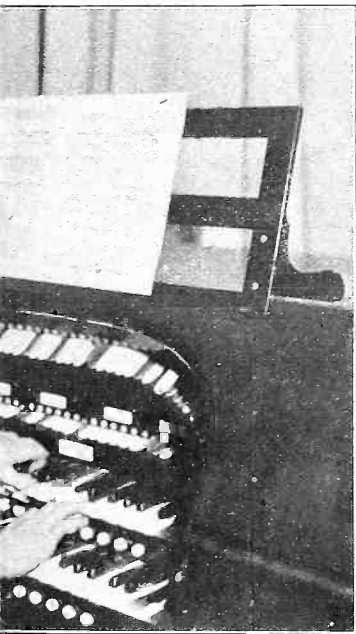


THE ORGAN is one of the most difficult the Crosley station in Cincinnati, Ohio, as perfect as possible, with the aid of a and audio amplifier. Many prominent plimented its wonderful tonal quality. thousands of listener

PHOTO BY WIRE



Owen D. Young inspecting the photo to New York City simultaneously with program of WEAf under National Broad-management.



instruments to transmit perfectly. WLW, ever, makes sure that this transmission is ally constructed studio organ shown above sts have played on this organ and com- same opinion has also been given by the in who have written.

REALISM CARRIED FROM GRIDIRON

Use of Only Two Microphones Provides the Crowd Atmosphere to Enliven Things at the Listener's Home

"How do you do it? How many mikes do you use?"

Those are only two of the many questions fans are asking Hal and Harry, football announcers of WMAQ.

Hal and Harry give a lot of the credit for their successful broadcast to Walter R. Lindsay, chief operator, who, with the other operators, has worked out the present method.

"Not so long ago," explains Mr. Lindsay, "it was thought the more mikes the better broadcast. But experience shows that fewer mikes, properly placed, give better results."

"To make the game realistic for the fans attending the contest via radio, there are but two microphones. One is placed down near the band in the center of the stand and the other within the glass enclosed broadcast booth."

"A mixer panel is used so that the microphone near the band may be kept slightly open all the time to permit a continuous background of cheers and music for the play-by-play account of the game by the announcer, which comes through the second microphone within the booth."

The creation of the crowd atmosphere is a goal all stations seek.

"Radio Educates," Says Manufacturer

Radio has accomplished something that the phonograph has never been able to do, according to Herman Rose, president of the Shamrock Manufacturing Company of Newark, N. J.

"Radio has made people listen to talks and lectures, to schools and politics," he said.

"The phonograph has tried to teach via the record route, but has never been successful. It has tried to put humorous monologues and dialogues into the home, but they always seemed to stay in the music store. The record maker has learned through bitter experience that phonographs are not built for speech reproduction."

"But radio, scorned by Edison, has done all these things."

"Radio colleges today have a greater number of students than a combination of all the regular colleges. Radio pupils tune in their lessons with a regularity that would put the remittance college man to shame. Radio can and does teach."

Farming Broadcast Proves Successful

The Department of Agriculture announced that radio has definitely proved itself an effective vehicle for the diffusion of agricultural information. The announcement follows:

The radio has definitely proved to be an effective new vehicle for diffusion of the department's information. Since October 4, when the new Fall schedule of programs went on the air, the response from broadcasting stations and farm homes has been enthusiastic. Thousands of letters, an average of about 500 a day, asking for enrollment cards, bulletins, and information, have been flowing in to the Radio Service. Stations write to express their own appreciation and that of their audiences. Farmers, who ordinarily find little time or inclination for correspondence, write many letters of appreciation and commendation. That the department's programs are successfully holding their own in the competition on the dials is evidenced by the numerous letters received.

Set For All Soon, Says Werrenrath

The musical leadership of the world will pass from Europe to America within the next generation largely because of radio developments, according to Reinald Werrenrath, American baritone, who believes practically every American home will have a radio within the next five years.

"Radio is bringing the finest music to the smallest farm," he added, "and it is a natural result that children will absorb its beauty, and will grow up with a finer appreciation of beauty and culture than their parents."

This popular concert artist was the first of the internationally famous singers to broadcast in the Atwater Kent Sunday night concert.

"By popularizing the classics, the phonograph and radio have contributed immeasurably to America's musical appreciation," he added. "Just how far reaching the effect of radio will be it is impossible to predict. In fact, it is overwhelming when one considers the possibilities of it, and the breadth of its influence. I was told that some time in the future we shall heat our homes and run our automobiles by radio. I do not doubt it, for if any one had told us ten years ago that the radio could do what it is doing today, we should have derided the idea."

Professor to Tell How to Pronounce

The educational effect of broadcasting may be exaggerated in some quarters but there is little doubt that it has a tremendous educational bearing on language and the art of speaking correctly. As programs which come to listeners by radio appeal almost wholly to the ear, pronunciation and grammatical construction of sentences are factors in molding the habits of people in speaking. With this thought in mind Professor William Tilley, Ph.D., will be heard in the regular weekly series of Columbia University lectures from WEAf on Mondays at 7:10 p. m.

Professor Tilley, who will give hints on the phonetics of speech, studied under Henry Sweet of England, and Prof. W. Victor, Univ. of Marburg, Germany.

COMPLETE STATION LIST

Corrected up to November 17

Station	Location	Owner	Meters	Station	Location	Owner	Meters
KDGE—Barrett, Minn.	Jaren Drug Co.	232.4	KFWU—Pineville, La.	Louisiana College	238	WABC—Asheville, N. C.	Asheville Battery Co. 254
KDKA—East Pittsburgh, Pa.	Westinghouse, house E. & M. Co.	309.1	KFWV—Portland, Ore.	Wilbur Jerman	212.6	WABI—Bangor, Me.	First Universalist Church 240
KDLR—Devils Lake, N. D.	Radio Elec. Co.	231	KFXB—Big Bear Lake, Cal.	B. C. Heller	202.6	WABO—Rochester, N. Y.	Hickson Elec. Co. Inc. 278
KDYL—Salt Lake City, Ia.	Intermountain Broadcasting Corporation	246	KFXD—Logan, Utah	Service Radio Company	205.4	WABR—Saco, O. So.	High School 263
KFAB—Lincoln, Neb.	News, Buck Auto Co.	340.7	KFXF—Denver, Co.	Pikes Peak Broadcasting Company	430.1	WABW—Wooster, O.	The College of Wooster 268
KFAD—Phoenix, Ariz.	Elec. Equip. Co.	273	KFXH—El Paso, Tex.	Bledsoe Radio Co.	242	WABX—Mount Clemens, Mich.	H. B. Joy 246
KFAF—San Jose, Cal.	A. E. Fowler	217.3	KFXJ—Near Edgewater, Col.	R. G. Howell	215.7	WABY—Philadelphia, Pa.	J. Magaldi, Jr. 242
KFAU—Boise, Idaho, Indep. Sch. Dist. of Boise		280.2	KFXR—Oklahoma City, Okla.	Classen Film Finishing Co.	214.2	WABZ—New Orleans, La.	Colis Place Baptist Church 275.1
KFBB—Havre, Mont.	F. A. Buttrey & Co.	275	KFY—Flagstaff, Ariz.	H. M. Costigan	205.4	WAD—Akron, O.	Allen T. Simmons 258
KFBC—San Diego, Calif.	Union League Club	380	KFYF—Oxnard, Cal.	Carl's Radio Inc.	214.2	WADF—Huron, Mich.	A. P. Mariet 275
KFBL—Everett, Wash.	Leese Bros.	224	KFYJ—Portland, Tex.	Houston Chronicle Publishing Company	238	WAGM—Royal Oak, Mich.	R. L. Miller 275
KFBI—Trinidad, Cal.	School District No. 1	238	KFYO—Texarkana, Tex.	Buchanan-Vaughan Co.	209.7	WAHG—Richmond Hill, N. Y.	A. H. Grebe 315.6
KFBU—Laramie, Wyo.	St. Matthews Cathedral	374.8	KFYR—Bismark, N. D.	Hoskins-Meyer, Inc.	248.7	WAGS—Somerville, Mass.	Willow Garages, Inc. 250
KFCB—Phoenix, Ariz.	Nielson Radio Supply Co.	238	KGAR—Tucson, Ariz.	Tucson Citizen	243.8	WAIT—Taunton, Mass.	A. H. Waite & Co. 229
KFDD—Boise, Idaho	St. Michael Cathedral	275.1	KGBU—Ketchikan, Alaska	Alaska Radio and Service Company	227	WAUI—Columbus, O.	American Ins. Union 293.9
KFDM—Beaumont, Tex.	Magnolia Petroleum Co.	315.6	KGBW—Joplin, Mo.	Martin Brotherson	228.9	WAMP—Minneapolis, Minn.	Raddison Radio Corp. 243.8
KFDY—Shreveport, La.	First Baptist Church	236.1	KGB—St. Joseph, Mo.	Julius B. Abercrombie	282.8	WARC—Medford, Mass.	American Radio & Research 261
KFDV—San Francisco, Cal.	S. D. Star	305.9	KGBS—Shelby, Neb.	Albert C. Dunning	347.8	WARS—Brooklyn, N. Y.	Amateur Radio Specialty Co. 295
KFDZ—Minneapolis, Minn.	H. O. Iverson	231	KGBZ—York, Pa.	Federal Live Stock Kenedy Company	202.6	WASH—Grand Rapids, Mich.	Baxter Launderers & Cleaners 256.3
KFEC—Portland, Ore.	Meier & Frank	252	KGCC—Decatur, Ia.	C. W. Greene	333.1	WATT—Portland-First District, Edison Electric, Ill.	243.8
KFEL—Denver, Colo.	E. P. O'Fallon, Inc.	254.1	KGCB—Oklahoma, Okla.	Wallace Radio Inst.	331	WBBA—W. Lafayette, Ind.	Purdue University 273
KFEQ—Oak, Neb.	Scroggins & Co.	268	KGCC—Newark, Ark.	Moore Motor Co.	239.9	WBAB—Harrisburg, Pa.	Pa. State Police 275
KFEY—Kellogg, Idaho	Bunker Hill & Sullivan	233	KGCC—Wayne, Neb.	Wayne Hospital	450	WBAL—Baltimore, Md.	Consolidated Gas & Light Co. 416.5
KFGB—Moberly, Mo.	First Baptist Church	242	KGCI—San Antonio, Tex.	Int. Radio Co.	239.9	WBAC—Decatur, Ill.	James Miliken University 270.1
KFGB—Booth, Ia.	Harvard Co.	263	KGCL—Seattle, Wash.	Tex. Int. Radio Co.	230.6	WBAP—Fort Worth, Tex.	Carver Pub. Inc. 475.9
KFH—Wichita, Kans.	Hotel Lassen	267.7	KGCM—San Antonio, Tex.	R. B. Bridge	210	WBAW—Nashville, Tenn.	Braid Elec. Co. 236.1
KFHA—Cunison, Colo.	Western State College of Colorado	252	KGCN—Concordia, Kans.	Alva E. Smith	210	WBAX—Wilkes Barre, Pa.	J. H. Stenger, Jr. 256
KFHL—Oskaloosa, Ia.	Penn. College	240	KGCR—Brookings, S. D.	Cutlers Broadcasting Service	252	WBBC—Brooklyn, N. Y.	P. J. Testan 249.9
KFT—Los Angeles, Cal.	Earl C. Anthony, Inc.	467	KGCX—Vida, Mont.	First State Bank	250	WBCL—Richmond, Va.	Grace Covenant Presbytery 228.9
KFT—Portland, Ore.	Benson Polytechnic Inst.	248	KGDA—Dell Rapids, S. D.	Home Auto Co.	254	WBDM—Chicago, Ill.	Atlas Investment 226
KFIO—Spokane, Wash.	North Central High School	274.6	KGDJ—Cresco, Ia.	E. J. Kott	405.2	WBEP—Petosky, Mich.	Petosky High School 416.5
KFII—Yakima, Wash.	First Methodist Church	256	KGDI—Seattle, Wash.	N. W. Radio Service Co.	361.2	WBFR—Roxville, N. Y.	Peoples Pulpit Ass'n 416.4
KFIU—Juneau, Alaska	Alaska Elec. Light & Power Co.	226	KGO—Oakland, Cal.	General Electric Co.	261.2	WBFW—Norfolk, Va.	Ruffner Junior H. S. 222
KFIZ—Fond Du Lac, Wis.	Fond Du Lac Commonwealth Reporter	273	KGTT—San Francisco, Cal.	Glad Tidings Temple & Bible Inst.	206.8	WBHY—Charlestown, S. C.	Washington Light & Power Co. 268
KFJB—Marshall, Mo.	Shall Electric Co.	218.8	KGU—Honolulu, T. H.	Marion A. Mulroney	270	WBIZ—Portland, Ore.	St. Martin's College 277.6
KFJC—Junction City, Kans.	R. B. Fegan	218.8	KGV—Lacey, Wash.	St. Martins College	277.6	WBK—Portland, Ore.	St. Martins College 277.6
KFJF—Oklahoma City, Okla.	Nat'l Radio Mfg. Co.	261	KHJ—Los Angeles, Cal.	Times Mirror Co.	405.3	WBNC—Chicago, Ill.	Foster & Connell 266
KFJJ—Astoria, Ore.	E. E. Marsh	245.8	KHQ—Spokane, Wash.	Willis Wasmser	394.5	WBND—Tilton, N. H.	Booth Radio 365
KFJM—Grand Forks, N. D.	Univ. of N. D.	278	KFLZ—Anita, Ia.	Atlantic Automobile Co.	272.6	WBES—Takoma Park, Md.	Bliss Electrical School 222
KFJR—Portland, Ore.	A. C. Dixon & Son	263	KJBS—San Francisco, Cal.	J. Brunton & Sons Co.	234.2	WBMS—North Bergen, N. J.	G. J. Schwerer 232.7
KFJY—Fort Dodge, Ia.	Tunwell Radio Co.	246	KJR—Seattle, Wash.	Northwest Radio Serv. Co.	384.4	WBNU—New York, N. Y.	Baruchrome Corp. 322.4
KFJZ—Fort Worth, Tex.	W. E. Branch	243	KLDS—Independence, Mo.	Reorganized Church of Jesus Christ	440.9	WBOQ—Richmond Hill, N. Y.	A. H. Grebe & Company, Inc. 236
KFKA—Greeley, Colo.	Colo. State Teachers Col.	273	KLS—Oakland, Cal.	Brothers	250	WBRC—Birmingham, Ala.	Birmingham Broadcasting Company 248
KFKB—Miford, Kans.	J. R. Brinkley, M.D.	431.4	KLX—Oakland, Cal.	Tribune Publishing Co.	508.2	WBRE—Wilkes Barre, Pa.	Baltimore Radio Exchange 231
KFKU—Lawrence, Kans.	Univ. of Kans.	275	KLZ—Denver, Col.	Reynolds Radio Co.	265.3	WBRS—Brooklyn, N. Y.	Universal Radio Mfg. Company 394
KFKX—Hastings, Neb.	Westinghouse, E. & M. Co.	288.3	KMA—Shenandoah, Ia.	May Seed & Nursery	461.3	WBZ—Charlottesville, N. C.	C. C. Cham. of Com. 275
KFKZ—Kirkville, Mo.	Cham. of Com.	255.4	KMJ—Fresno, Cal.	The Fresno Bee	234.2	WBZ—Springfield, Mass.	Westinghouse E. & M. Co. 333.1
KFLR—Albuquerque, N. M.	Univ. of N. M.	236	KMO—Clay Center, Neb.	M. M. Johnson Co.	228.9	WBZA—Boston, Mass.	Westinghouse E. & M. Co. 333.1
KFLU—San Benito, Tex.	San Benito Radio Club	236	KMOX—Tacoma, Wash.	KMO Inc.	250	WCAC—Mansfield, Conn.	Conn. Agri. College 275
KFLV—Rockford, Ill.	Swedish Evangelist Church	229	KMOT—St. Louis, Mo.	St. Louis	280.2	WCAD—Watson, N. Y.	St. Lawrence University 263
KFLX—Galveston, Tex.	Geo. Roy Clough	240	KMTR—Los Angeles, Cal.	Echophone Express	336.9	WCAE—Pittsburgh, Pa.	Kaufman & Baer Co. 461.3
KFLY—Sioux City, Ia.	Norwinds College	261	KOA—Denver, Col.	General Electric Co.	322.4	WCAH—Columbus, Ohio	Eufrat Elec. Co. 265.3
KFNH—Shenandoah, Ia.	Morning Field Store	461.3	KOAC—Corvallis, Ore.	Oregon Agriculture Col.	280.2	WCAJ—University Place, Neb.	Neb. Wesleyan University 254
KFOA—Seattle, Wash.	Rhodes Dept. Store	252.4	KOB—State College, N. M.	New Mexico College	348.6	WCAL—Northfield, Minn.	St. Olaf College 336.9
KFOB—Burlingame, Cal.	K. F. O. B. Inc.	225.4	KOC—Omaha, Neb.	Omaha Central H. S.	258	WCAM—Camden, N. J.	City of Camden 336.9
KFON—Long Beach, Cal.	Echophone Radio Shop	233	KOCW—Chickasha, Okla.	Oklahoma College for Women	252	WCAR—Baltimore, Md.	Brager of Baltimore 275
KFOO—Salt Lake City, Utah	Latter Day Saints Union	236	KOIL—Council Bluffs, Ia.	Mona Motor Co.	305.9	WCAR—Antonio, Tex.	Southern Radio Corporation 248
KFOR—David City, Neb.	Tire & Electric Co.	236	KOIN—Portland, Ore.	KOIN Inc.	319	WCAT—Rapid City, S. D.	School of Mines 240
KFOT—Wichita, Kans.	College Hill Radio Club	231	KOMO—Seattle, Wash.	Birt F. Fisher	305.9	WCAU—Philadelphia, Pa.	Universal Bldg. Co. 278
KFOX—Omaha, Neb.	Technical H. S.	231	KOWW—Walla Walla, Wash.	F. A. Moore	285	WCAX—Burlington, Vt.	University of Vermont 254
KFOY—St. Paul, Minn.	Beacon Radio Service	252	KPJM—San Francisco, Cal.	Hale Bros. Inc.	428.3	WCAX—Allentown, Pa.	Carthage College 245.8
KFPL—Dublin, Tex.	C. C. Baxter	252	KPPC—Pasadena, Cal.	Pasadena Presbyterian Church	233.1	WCBD—Concord, Ill.	Wilbur Glenn Voliva 344.6
KFPF—Greenville, Tex.	New Furniture Co.	242	KPRC—Houston, Tex.	Houston Printing Co.	229	WCBH—Oxford, Miss.	University of Miss. 242
KFPF—Los Angeles, Cal.	L. A. County Forestry Department	231	KPSN—Pasadena	Star-News, Pasadena, Cal.	315.6	WCBM—Baltimore, Md.	Hotel Chateaufort 229.7
KFPY—Spokane, Wash.	Symons Investment Co.	272.6	KQV—Pittsburgh, Pa.	Doubleday Hill Electric Company	275	WCCR—Portland, R. I.	C. H. Mosser 240
KFOA—St. Louis, Mo.	The Principia	261	KRAC—Shreveport, La.	Caddo Radio Club	220	WCCO—Anoka, Minn.	Washburn Crosby Co. 416.4
KFOB—Fort Worth, Tex.	Searchlight Publishing Co.	508.2	KRLD—Dallas, Tex.	Dallas Radio Labs	357.1	WCFL—Chicago, Ill.	Chicago Fed. of Labor 491.5
KFQD—Anchorage, Alaska	Anchorage Radio Club	300	KRSQ—Seattle, Wash.	Radio Sales Corp.	499.7	WCFT—Tullahoma, Tenn.	Knights of Pythias Home 250.2
KFQF—Iowa City, Ia.	G. S. Carson, Jr.	224	KRE—Berkeley, Cal.	Berkeley Daily Gazette	256	WCGU—Lakewood, N. J.	C. G. Ungar 350.6
KFOU—Holy City, Cal.	W. E. Riker	214	KSAC—Manhattan, Kans.	Kansas State Agricultural College	340.7	WCLO—Camp Lake, N. J.	C. E. Whitmore 211
KFQW—North Bend, Wash.	C. F. Knerim	215.7	KSBA—Shreveport, La.	W. G. Paterson	312.6	WCLS—Joliet, Ill.	H. M. Couch 214
KFOZ—Hollywood, Cal.	Taft Products Co.	226	KSEL—Pocatello, Ida.	GSEL Broadcasting Co.	299.8	WCMA—Culver, Ind.	Culver Military Academy 258.5
KFRB—Beaville, Tex.	Hall Brothers	268	KSL—Salt Lake City, Utah	Radio Service Corp.	299.8	WCOA—Pensacola, Fla.	City of Pensacola 222.1
KFRS—San Francisco, Cal.	City of Paris	268	KSMR—Santa Maria, Cal.	Santa Maria Valley R. R.	282.8	WCSB—Chicago, Ill.	C. R. White 416.4
KFRW—Columbia, Mo.	Stephens College	499.7	KSO—Clarinda, Ia.	A. Berry Seed Co.	302.8	WCSH—Portland, Me.	H. R. Rines 499.7
KFRW—Olympia, Wash.	Western Bldg. Co.	218.8	KTAB—Oakland, Cal.	Ass. Broadcasters	293.9	WCSP—Springfield, Mo.	W. H. Keen 234.2
KFSD—San Diego, Cal.	Airline Radio Corp.	245.8	KTBI—Los Angeles, Cal.	Bible Institute	263	WCWK—Fort Wayne, Ind.	C. W. Sclen 207
KFSG—Los Angeles, Cal.	Echo Park Evangelist Association	275	KTBR—Portland, Ore.	M. E. Brown	263	WCWS—Portland, Mass.	C. W. Sclen 207
KFUL—Galveston, Tex.	T. Goggan & Bros.	258.9	KTFH—Fort Springs, Ark.	New Arlington Hotel	374.8	WCX—Pontiac, Mich.	Detroit Free Press 516.9
KFUM—Colorado Springs, Colo.	W. D. Corley	239.9	KTUS—Muscatine, Ia.	Norman Barker	333.1	WJR—Pontiac, Mich.	Jewett Radio & Phonograph Co. 516.9
KFUS—St. Louis, Mo.	Concordia Seminary	545.1	KTUE—Houston, Tex.	U. H. Electric	263	WDAD—Nashville, Tenn.	Dads Automobile Accessories Inc. 226
KFUR—Denver, Colo.	First National Gen. Hosp.	244	KTW—Seattle, Wash.	First Presbyterian Church	253	WDAA—Tampa, Fla.	Tampa Daily Times 273
KFUR—Orden, Utah	Pyramid Building Co. Inc.	254.3	KUOA—Fayetteville, Ark.	University of Ark.	299.8	WDAA—Kansas City, Mo.	Kansas City Star 256.6
KFUS—Oakland, Cal.	L. L. Sherman	256	KUOM—Missoula, Mont.	University of Mont.	243.8	WDAG—Amarillo, Tex.	J. L. Martin 263
KFUT—Salt Lake City, Utah	Univ. of Utah	263	KUSD—Vermillion, S. D.	University of S. D.	278	WDAH—El Paso, Tex.	Trinity Methodist Ch. 267.7
KFUU—Orland, Cal.	H. C. Colburn & E. L. Mathewson	220.4	KUT—Austin, Tex.	University of Tex.	231	WDBE—Fargo, N. D.	Radio Equipment Corp. 260.7
KFV—Venice, Cal.	C. I. McWhinnie	205.4	KWCR—Bristow, Okla.	SW Sales Corp.	374.8	WDBJ—Norfolk, Va.	Richardson, Wayland Elec. Corp. 228.9
KFVE—St. Louis, Mo.	Venson Broadcasting Corporation	239.9	KWG—Stockton, Cal.	Portable Wireless Telegraph Co.	248	WDBK—Cleveland, O.	M. F. Broz 227
KFVG—Independence, Kans.	First M. E. Church	236.1	KWKC—Kansas City, Mo.	Wilson Duncan Studios	236	WDBO—Winter Park, Fla.	Rollins College 240
KFVI—Houston, Tex.	Headquarters Troop, 56th Calvary	227	KWKH—Shreveport, La.	The W. K. Henderson Iron Works and Supply Co.	312.3	WDBZ—Kingston, N. Y.	Kingston Radio Club 232.4
KFVN—Fairmont, Minn.	C. E. Bagley	240	KWKS—Pullman, Wash.	State College of Wash.	348.6	WDEL—Wilmington, Del.	Wilmington Electric Supply Company 265.3
KFVR—Denver, Col.	Moonlight Ranch	244	KWTC—Santa Ana, Cal.	J. J. Hancock	252.8	WDOD—Chatanooga, Tenn.	Chattanooga Radio Co. Inc. 256
KFVS—Cape Girardeau, Mo.	Cape Girardeau Battery Station	224	KWUC—Lemars, Western Union College		278	WDRN—New Haven, Conn.	Doolittle Radio Corporation 268
KFVY—Albuquerque, N. M.	Radio Supply Co.	250	KWWG—Brownsville, Tex.	City of Brownsville	278	WDXL—Detroit, Mich.	DXL Radio Corp. 296.9
KFWB—Hollywood, Cal.	Warner Bros. Pic.	252	KYWG—Chicago, Ill.	Westinghouse E. & M. Co.	535.4	WDWF—Watson, R. I.	D. W. Flint, Inc. 440.9
KFWC—San Bernardino, Cal.	L. E. Wall	291.1	KXRO—Seattle, Wash.	Brott Lab.	240	WEAF—N. Y. City	National Bldg. Co. of Am. 491.5
KFWF—St. Louis, Mo.	St. Louis Truth Center	214.2	KZM—Oakland, Cal.	Frederic D. Allen	240	WEAT—Ithaca, N. Y.	Cornell University 254
KFWH—Eureka, Cal.	F. Wellington Morse, Jr.	254.1	KZAD—Cincinnati, O.	Ohio Mechanical Inst.	258		
KFWI—San Francisco, Cal.	Radio Entertainments	249.2	KZC—Chicago, N. Y.	Daily Provers Journal	277.6		
KFWM—Oakland, Cal.	Educa. Society	315.6	WAAM—Newark, N. J.	Local 8, Nelson	263		
KFWO—Avalon, Cal.	Lawrence Mott	211.1	WAAB—Omaha, Neb.	Omaha Grain Exchange	384.4		
			WABB—Harrisburg, Pa.	Harrisburg Radio Co.	204		

Station	Location	Owner	Meters	Station	Location	Owner	Meters	Station	Location	Owner	Meters
WEAM	North Plainfield, N. J.	Borough of North Plainfield	261	WJAG	Norfolk, Neb.	Norfolk Daily News	352.7	WOAN	Lawrenceburg, Tenn.	J. D. Vaughn	282.8
WEAN	Providence, R. I.	The Shepard Co.	362	WJAK	Kokomo, Ind.	Kokomo Tribune	354.1	WOAW	Omaha, Neb.	Woodmen of the World	526
WEAO	Columbus, O.	Ohio State University	293.9	WJAM	Cedar Rapids, Ia.	D. M. Rupp	268	WOAX	Trenton, N. J.	F. J. Wood	520
WEAR	Cleveland, O.	Willard Storage Battery Company	389.4	WJAR	Providence, R. I.	The Outlet Co.	305.9	WOBB	Chicago, Ill.	Longacre Engrg. Const'n Co.	555.2
WEAU	Sioux City, Ia.	Davidson Bros. Co.	275	WJAS	Pittsburg, Pa.	Pittsburgh Radio Supply House	275	WOC	Davenport, Ia.	Palmer School of Chiropractic	483.6
WEBC	Superior, Wisc.	W. C. Bridges	242	WJAX	Jacksonville, Fla.	City of Jacksonville	336.9	WOGB	Orlando, Bdestg. Co.	Orlando, Fla.	293.7
WEBH	Chicago, Ill.	Edgewater Beach Hotel	370.2	WJBA	Joliet, Ill.	H. L. Lantz	254.1	WOCL	Jamestown, N. Y.	A. B. Newton	275.1
WEBJ	New York, N. Y.	Third Ave. R. Co.	226	WJBB	St. Petersburg, Fla.	Financial Journal	254.1	WODA	Patterson, N. J.	O'Dea Temple of Music	390.9
WEBL	Portland, Me.	Portland Radio Co.	226	WJBC	La Salle, Ill.	Hummer Furniture Co.	234	WOI	Ames, Ia.	Iowa State College	270
WEBR	Buffalo, N. Y.	H. H. Howell	244	WJBD	Red Bank, N. J.	R. S. Johnson	218.8	WOK	Homewood, Ill.	Neutrowood Radio Mfg. Co.	217.3
WEBW	Beloit, Wisc.	Beloit College	238	WJBK	Ypsilanti, Mich.	E. J. Goodwin	253	WOKC	Peekskill, N. Y.	H. E. Smith	232.4
WEBZ	Savannah, Ga.	Savannah Radio Corp.	263	WJBW	Decatur, Ill.	Wm. Gushard Dry Goods Co.	270	WOMT	Manitowish, Wisc.	Mikado Thea	254.1
WEDC	Chicago, Ill.	Emil Denegmark Co.	422.3	WJBX	New Orleans, La.	C. Carlson, Jr.	227.1	WOO	Philadelphia, Pa.	J. Wanamaker	508.2
WEEL	Boston, Mass.	Edison Electric Co.	484.6	WJBT	Chicago, Ill.	John S. Boyd	468.5	WOOD	Grand Rapids, Mich.	Grand Radio Co.	241.8
WEHS	Chicago, Ill.	O. Fordham	202.6	WJBU	Lewisburg, Pa.	Bucknell University	211.1	WOE	Kansas City, Mo.	Unity School	278
WEMC	Berrien Springs, Mich.	Emanuel Miss. College	315.6	WJBV	Woodhaven, N. Y.	Union Course Club	288.3	WOR	Newark, N. J.	L. Bamberger & Co.	405.2
WENR	Chicago, Ill.	All-American Radio Corp.	266	WJBW	New Orleans, La.	C. Carlson, Jr.	227.1	WORD	Batavia, Ill.	Peoples Pulpit Association	275
WEW	St. Louis, Mo.	St. Louis University	360	WJBX	Osterville, Mass.	Reverend & Ross	260	WOS	Jefferson City, Mo.	State Marketing Bureau	440.9
WFAA	Dallas, Tex.	Dallas News & Dallas Times Herald	475.9	WJBY	Gadsden, Ala.	N. C. Construction Co.	370.2	WOVO	Fort Wayne, Ind.	Main Automobile Supply Co.	227
WFAM	St. Cloud, Minn.	Times Publishing Co.	273	WJJD	Moosetown, Ill.	Loyal Order of Moose	370.2	WPAK	Agricultural College, N. D.	N. D.	275
WFAY	Lincoln, Neb.	University of Neb.	275	WJR	Pontiac, Mich.	Jewett Radio & Phonograph Co.	516.9	WPAC	Cliffside, N. J.	(See WQAO)	361.2
WFBC	Knoxville, Tenn.	First Baptist Church	250	WJW	New York, N. Y.	U. B. Ross	516.9	WPCC	Chicago, Ill.	North Shore Congregational Church	258
WFBE	Cinc., O.	Carnegie Place Hotel	232.4	WJY	New York, N. Y.	Nat. Broadcasting Co.	406.2	WPCH	N. Y. C. N. Y.	Concourse Radio Corp.	273
WFBG	Altoona, Pa.	W. F. Gable Co.	278	WJZ	Bound Brook, N. J.	Nat. Bdestg. Co. of Amer.	454.3	WPQ	Buffalo, N. Y.	Hiram L. Turner	205.4
WFBJ	Collegeville, Minn.	St. John's University	252	WKAF	Milwaukee, Wisc.	WKAF Broadcasting Corp.	261	WPG	Atlantic City, N. J.	Municipality of Atlantic City	299.8
WFBM	Indianapolis, Ind.	Merchant H. L. Co.	268	WKAQ	San Juan, P. R.	Radio Corporation of Porto Rico	340.7	WPRC	Harrisburg, Pa.	W. H. Patterson & Radio Co.	215.7
WFBP	Baltimore, Md.	Fifth Infantry, National Guard	254	WKAP	East Lansing, Mich.	Michigan State College	285.8	WPSC	State College, Pa.	Pa. State College	261
WFBZ	Galesburg, Ill.	Knox College	254	WKAV	Laconia, N. H.	Laconia Radio Club	233.7	WQA	Parkensburg, Pa.	H. A. Beale, Jr.	220
WFCI	Pawtucket, R. I.	Frank Crook, Inc.	229	WKBA	Chicago, Ill.	Arrow Battery Co.	209.7	WQAC	Amarillo, Tex.	Gish Radio Service	234
WFDI	Ft. Mich., Frank D. Allan		236	WKBB	Joliet, Ill.	Sanders Brothers	282.8	WQAE	Springfield, Vt.	Moore Radio News Station	246
WFDD	Philadelphia, Pa.	University of Pa.	394.5	WKBD	Jersey City, N. J.	F. V. Bremer	235	WQAM	Miami, Fla.	Electrical Equipment Co.	285.5
WFKB	Chicago, Ill.	Vesta Battery Co.	217.3	WKBE	Webster, Mass.	K. & B. Electric Co.	270.1	WQAN	Scranton, Pa.	Scranton Times	250
WFLR	Brooklyn, N. Y.	R. M. Lacey	205.4	WKBF	Indianapolis, Ind.	P. D. Stanton	244	WQAO	Cliffside, N. J.	Calvary Baptist Church (WPAF used when Palisade Amusement Park Program is on)	361.2
WGAL	Lancaster, Pa.	Lancaster Electric Supply and Construction Co.	248	WKBK	La Crosse, Wisc.	Callaway Music	249.9	WQJ	Chicago, Ill.	Calumet Co.	447.5
WGBB	Freeport, N. Y.	H. H. Carman	243.8	WKBI	Chicago, Ill.	F. L. Schoenwolf	220.4	WRAF	Laporte, Ind.	Radio Club, Inc.	312.6
WGBM	Memphis, Tenn.	First Baptist Church	236	WKBJ	St. Petersburg, Fla.	Gospel Tabernacle, Inc.	280	WRAH	Providence, R. I.	Staley N. N. C.	235
WGBI	Evansville, Ind.	Evansville Furniture Co.	236.1	WKBL	Monroe, Mich.	Monrona Radio Mfg. Co.	252	WRK	Escanaba, Mich.	Economy Light Co.	256
WGBL	Scranton, Pa.	Scranton Bdg. Inc.	239.9	WKBM	Youngstown, O.	Radio Elec. Serv. Co.	312.6	WRAM	Galesburg, Ill.	Lombard College	244
WGBS	Astoria, L. I., N. Y.	Gimbel Bros.	315.6	WKBN	Youngstown, O.	Radio Elec. Serv. Co.	312.6	WRAW	Reading, Pa.	Avenue Radio & Electric Shop	238
WGBU	Fulford-by-the-Sea, Fla.	Florida Cities Finance Company	278	WKBP	Battle Creek, Mich.	Enquirer & News	265	WRAX	Philadelphia, Pa.	Berachah Ch. Inc.	267.7
WCBX	Oreno, Me.	University of Me.	234.2	WKBO	New York City	Starlight Amusement Park	285	WRBC	Walparaiso, Ind.	Immanuel Lutheran Church	278
WGCN	Newark, N. J.	May Radio Bdestg. Corp.	252	WKBR	Auburn, N. Y.	Chas. J. Heiser	236.3	WRCC	Washington, D. C.	Nat. Bdestg. Co. of Amer.	468.5
WGCH	Chicago, Ill.	Oak Leaves Broadcasting Corporation	315.6	WKBS	Galesburg, Ill.	P. N. Nelson	361.2	WRCE	Raleigh, N. C.	Wayne Radio Co.	252
WGHB	Clearwater, Fla.	Fort Harrison Hotel	265.3	WKBT	New Orleans, La.	1st Baptist Church	249	WREC	Coldwater, Miss.	Wooten's Radio Shop	254
WGHP	Detroit, Mich.	G. H. Phelps, Inc.	270	WKBY	Brookville, Ind.	Knox Battery & Electric Co.	236.1	WREO	Lansing, Mich.	Reo Motor Car Co.	225.5
WGM	Jeanette, Pa.	Verne & Elton Spencer	372	WKCB	Danville, Pa.	(Portable) F. Quick	220	WRES	Wollaston, Mass.	H. L. Sawyer	300
WGMU	Portland, N. Y.	A. H. Grebe & Co.	236	WKCD	Ludington, Mich.	K. L. Ashbacher	262.5	WRHF	Washington, D. C.	Washington Radio Hospital Fund	256
WGNC	Chicago, Ill.	Chicago Tribune	302.8	WKCE	Kenosha, Wisc.	E. A. Dato	428.3	WRHM	Minneapolis, Minn.	Rosedale Hospital	252
WGND	Buffalo, N. Y.	Federal Tel. & Tel. Co.	319	WKCF	Lancaster, Pa.	Kirk Johnson & Co.	258.5	WRK	Hamilton, O.	Doron Brothers Electric Co.	270
WGST	Atlanta, Ga.	School of Music	270	WKCG	Cincinnati, O.	The Kodel Radio Corp.	423.3	WRM	Urbana, Ill.	University of Ill.	272
WGWB	Milwaukee, Wisc.	Radiocast Corp.	384.4	WKCH	Tulsa, Okla.	First Christian Church	230	WRMO	Motor Yacht "MU-I", A. H. Grebe & Co.	236	
WGY	Schenectady, N. Y.	G. E. Co.	379.5	WKCI	Louisville, Ky.	W. V. Jordan	250	WRNY	N. Y. C.	Experiments Publishing Co.	373.8
WHA	Madison, Wisc.	University of Wisc.	535.4	WKCL	Minneapolis, Minn.	University of Minnesota	278	WRR	Dallas, Tex.	City of Dallas	246
WHAD	Milwaukee, Wisc.	Marquette Univ.	275	WKCM	Minneapolis, Minn.	University of Minnesota	278	WRST	Bay Shore, N. Y.	Radiotel Manufacturing Co., Inc.	215.7
WHAM	Rochester, N. Y.	Eastman School of Music	273	WKCN	Minneapolis, Minn.	University of Minnesota	278	WRVA	Richmond, Va.	Larus & Bro. Co., Inc.	256
WHAP	New York, N. Y.	Wm. H. Taylor Finance Corp.	433.1	WKCO	Minneapolis, Minn.	University of Minnesota	278	WSCI	Cincinnati, O.	United States Playing Card Co.	325.9
WHAR	Atlantic City, N. J.	F. D. Cooks Sons	275	WKCB	Stevens Point, Wisc.	Wisc. Department of Education	278	WSAJ	San Francisco, Calif.	City College	229
WHAS	Louisville, Ky.	Courier Journal & Louisville Times	399.8	WLBB	Elgin, Ill.	Liberty Weekly Inc.	302.8	WSAN	Allentown, Pa.	Allentown Call Publishing Co., Inc.	229
WHB	Kansas City, Mo.	Rensselaer Polytechnic Inst.	379.5	WLBI	Elgin, Ill.	Liberty Weekly Inc.	302.8	WSAR	Fall River, Mass.	Doughty & Welch Electric Co.	254.1
WHBA	Oil City, Pa.	C. C. Shaffer	365.6	WLIT	Philadelphia, Pa.	Lit Brothers	394.5	WSAV	Houston, Tex.	Clifford W. Vick	247.8
WHBC	Canton, O.	Rev. E. P. Graham	254	WLS	Crete, Ill.	Sears Roebuck Co.	344.5	WSAZ	Chicago, Ill.	Zenith Radio Corporation	268
WHBD	Bellefontaine, O.	Chamber of Com.	222.1	WLSL	Cranston, R. I.	The Lincoln Studios, Inc.	440.9	WSB	Atlanta, Ga.	Atlanta Journal Co.	428.3
WHBF	Rock Island, Ill.	Bearsley Spec. Co.	222	WLTS	Chicago, Ill.	Lane Technical High School	228	WSBC	Chicago, Ill.	World Battery Co.	288.3
WHBG	Harrisburg, Pa.	John S. Skane	231	WLW	Harrison, O.	The Groves Radio Corp.	253	WSBF	St. Louis, Mo.	Stix Baer & Fuller	273
WHBI	Portland, Ninth District, C. L. Carrell		215	WLWL	N. Y. C.	Paulist Fathers	384.4	WSBT	South Bend, Ind.	South Bend Tribune	315
WHBJ	Portland, Ninth District, C. L. Carrell		215.7	WMAC	Cazenovia, N. Y.	C. B. Meredith	275	WSDA	N. Y. C.	Seventh Day Adventist Ch.	263
WHBN	St. Petersburg, Fla.	First Avenue M. E. Church	238	WMAF	Dartmouth, Mass.	Round Hills Radio Corp.	440.9	WSKC	Bay City, Mich.	World's Star Knitting Co.	261
WHBP	Johnstown, Pa.	Johnstown Auto Co.	235	WMAK	Lockport, N. Y.	Norton Laboratories	266	WSM	Nashville, Tenn.	National Life & Accident Insurance Co.	282.8
WHBO	Memphis, Tenn.	St. Johns M. E. Ch.	233	WMAL	Washington, D. C.	M. A. Lease Optical Co.	212.6	WSMZ	New Orleans, La.	Sanger Amusement Co. & Maison Blanche Co.	319
WHBU	Anderson, Ind.	Riviera Theatre & Bings Clothing	218.8	WMAN	Columbus, O.	Haskett Radio Station	278	WSMH	Dayton, Ohio	Shattuck Music House	240
WHBW	Philadelphia, Pa.	D. R. Kienzie	215.7	WMAQ	Chicago, Ill.	Chicago Daily News	447.5	WSMI	Wasson, O.	R. M. K. Radio Corp.	275
WHBY	West De Pere, Wisc.	St. Norberts College	249.9	WMAY	St. Louis, Mo.	Kings Highway Presb. Church	243	WSOE	Milwaukee, Wisc.	School of Engineering of Milwaukee	246
WHDI	Minneapolis, Minn.	W. H. Dunwoody Institute	278	WMBA	Macon, Ga.	Merced University	261	WSRO	Hamilton, O.	H. W. Fahlander	252
WHEC	Rochester, N. Y.	Hickson Electric Co., Inc.	258	WMBB	Chicago, Ill.	American Bond & Mortgage Co.	250	WSSH	Boston, Mass.	Tremont Temple Baptist Church	260.7
WHFC	Chicago, Ill.	Hotel Flauders	285.5	WMBG	Detroit, Mich.	Michigan Broadcasting Co., Inc.	256	WSUI	Uia City, Iowa	State University of Ia.	483.6
WHK	New York, N. Y.	Radio Air Service Corp.	272.6	WMBF	Miami Beach, Fla.	Fleetwood Hotel Corp.	384.4	WSWS	Buffalo, N. Y.	Seneca Vocational Sch.	218.8
WHN	New York, N. Y.	Radio Schubl	361.2	WMBI	Chicago, Ill.	Moody Bible Institute	288.3	WTAB	Fall River, Mass.	Fall River Daily	275.1
WHO	Des Moines, Ia.	Bank of Ia.	526	WMCA	Hoboken, N. J.	Greely Square Hotel	499.7	WTAD	Carthage, Ill.	E. Compton	236
WHOG	Huntington, Ind.	Huntington Bdestg. Association	241.8	WMR	Jamaica, N. Y.	Percey Prinz	277.1	WTAC	Worcester, Mass.	Worcester Telegram	545.1
WHT	Deerfield, Ill.	Radiophone Bdestg. Corp.	399.8	WMSC	N. Y. C.	Nadison Square Garden Broadcasting Corp.	302.8	WTAL	Toledo, O.	Toledo Radio & Electric Co.	252
WIAD	Philadelphia, Pa.	Howard R. Miller	250	WMNB	Boston, Mass.	Shepard Stores	280.2	WTAM	Cleveland, O.	Willard Storage Battery Co.	389.4
WIAS	Burlington, Ia.	Home Electric	254	WMNC	Boston, Mass.	Shepard Stores	430.1	WTAR	San Claire, Wisc.	C. S. Van Gordan	254.1
WIB	Madison, Wisc.	Capital Times-Strand Theatre	236.1	WMND	Norman, Okla.	University of Okla.	254	WTAW	College Station, Tex.	Agricultural & Mechanical College of Texas	290
WIBG	Elkins Park, Pa.	St. Paul's Protestant Episcopal Church	222	WMNL	Omaha, Neb.	Omaha Central High School	258	WTAX	Streator, Ill.	Williams Hardware Co.	231
WIBH	New Bedford, Mass.	Elite Radio Stores	209.7	WMNT	Philadelphia, Pa.	Lennin Brothers Co.	250	WTAZ	Lambertville, N. J.	Thomas J. McGuire	261
WIBI	Flushing, L. I., N. Y.	F. B. Zittel, Jr.	218.8	WMNX	Yankton, S. D.	Dakota Radio Apparatus Co.	244	WTIC	Hartford, Conn.	Travelers Insurance Co.	475.9
WIBJ	Portland, Ill.	C. L. Carrell	215.7	WMNBH	New Bedford, Mass.	New Bedford Hotel	247.8	WTRC	N. Y. C.	20th Dist. Rep. Club	239.9
WIBO	Chicago, Ill.	Belison Brothers	226	WMNJ	Newark, N. J.	Radio Shop of Newark	252	WWAE	Plainfield, Ill.	Electric Park	384.4
WIBR	Weirton, W. Va.	Arthur C. Owings	246	WMNO	Knoxville, Tenn.	Peoples Tel. & Tel.	267.7	WWJ	Detroit, Mich.	Evening News Association (Detroit News)	352.7
WIBS	Elizabeth, N. J.	Thos. F. Hunter	202.6	WMNR	Greensboro, N. C.	W. V. Nelson	233.7	WWL	New Orleans, La.	Loyola University	275
WIBU	Poynette, Wisc.	The Electric Farm	222	WMNY	New York, N. Y.	Department of Plants & Structures	526	WWRL	Woodside, N. Y.	Woodside Radio Laboratories	258.5
WIBW	Logansport, Ind.	Dr. L. L. Dill	220	WMO	San Antonio, Tex.	Sout. Engrg. Co.	394.5				
WIBX	Utica, N. Y.	WIBX, Inc.	205.4								
WICC	Bridgeport, Conn.	Bridgeport Bdestg. Sta.	285								
WICB	Montgomery, Ala.	A. D. Trum	273								
WIL	St. Louis, Mo.	Benson Radio Co.	247.8								
WIOD	Miami, Fla.	Carl G. Gier	508.2								
WIP	Philadelphia, Pa.	Gimbel Bros.	352.7								
WJAD	Waco, Tex.	Jackson's Radio Engineering Laboratories	407								
WJAF	Ferndale, Mich.	J. S. Fernberg Radio Co.	407								

TELEPHONE TOUR IS WEAFF'S STUNT

Mary Garden at Chicago, and Will Rogers, at Independence, Kan., Heard at Celebration of New Ownership—24 Stations Transmit Event

Radio listeners throughout a greater part of the United States heard Mary Garden, Will Rogers, Weber and Fields and a host of other noted artists and musical organizations in a four-hour radio program marking the formal bow of the National Broadcasting Company, the new owners of WEAFF. The program was broadcast simultaneously by twenty-two stations linked with WEAFF and WJZ in New York City. The majority of the program was presented before a microphone installed in the grand ballroom of the Hotel Waldorf-Astoria in New York City, where more than 1,000 guests made up a visible audience.

A remarkable demonstration of the use of telephone lines as an adjunct for broadcasting was displayed when, without interruption of the program, the announcer at the Waldorf introduced Mary Garden. She was standing before a microphone in her apartment studio in the Hotel Belmont, Chicago. Miss Garden immediately began her program, several soprano solos, and was heard by the audience in the Waldorf in addition to those listening into receivers.

Rogers Is Heard

Later the same demonstration was witnessed when Mr. Rogers was introduced from New York and replied with a fifteen minute program from his dressing room in Memorial Hall, Independence, Kan., where he was appearing at a show.

The broadcast was opened at 8 p.m., New York time, with an address by Merlin Hall Aylesworth, the newly elected president of the National Broadcasting Company, sponsors of the program. In a five minute talk Mr. Aylesworth told of what the new company was attempting to do in its work as a program maker.

"We are attempting, in this evening's presentation, to give you just a glimpse of the goal we will strive to reach in the make-up of programs under our supervision," he said.

In addition to Miss Garden, Mr. Rogers and Weber and Fields, the following artists and musical organizations participated: Titta Ruffo, baritone of the Metropolitan Opera Company; Harold Bauer, pianist, who was engaged while in Europe and found it necessary to advance his sailing date to arrive in time for the broadcast; the New York Symphony Orchestra, Walter Damrosch conducting; the New York Oratorio Society, Albert Stoessel conducting; the Goldman Band, Edwin Franko Goldman conducting; an Operatic Sextette, direction of Cesare Sodero, and consisting of Mesdames Genia Zielinska and Devora Nadworney and Guiseppe di Benedetto, Milo Picco, Justin Lawrie and Nino Ruisi, all artists well known to a large radio audience; a light opera company, also under the direction of Mr. Sodero, and composed of Mesdames Adele Parkhurst, and Frances Paperte and George Obrien, Justin Lawrie, Theodore Webb and Jack Oakley; Vincent Lopez, George Olsen, Ben

Bernie and B. A. Rolfe and their respective orchestras.

Stations In Chain

The following broadcasting stations participated in the simultaneous transmission of the program in addition to WEAFF and WJZ in New York City; WEEL, Boston; WJAR, Providence; WBZ, Springfield, (Mass.); WTAG, Worcester; WTIC, Hartford; WDRC, New Haven; WGY, Schenectady; WGR, Buffalo; WLIT, Philadelphia; WRC, Washington, (D.C.); WCSH, Portland (Me.); WCAE and KDKA, Pittsburgh; WTAM, Cleveland; WSAI, Cincinnati; WWJ, Detroit; WGN and KYW, Chicago; WHAD, Milwaukee; KSD, St. Louis; WCCO, Minneapolis-St. Paul, and WDAF, Kansas City (Mo.).

One of the surprises of the evening was the display of a photograph taken of Mary Garden while she was singing in her room in the Hotel Belmont, Chicago. It was transmitted to New York City over the telephone lines of the American Telephone and Telegraph Company and flashed on the screen as a stereopticon to the visible audience in the Waldorf before the four-hour program had ended.

Advisory Board Named

Mr. Aylesworth announced the names of the members of the Advisory Radio Council, made up of representatives of various professions and phases in public life, which will advise as to the best type of program from the public's point of view. The list:

Walter Damrosch, conductor New York Symphony Orchestra.

A. E. Alderman, president University of Virginia.

John W. Davis, lawyer.

Francis D. Farrell, president Kansas Agricultural College.

William Green, president American Federation of Labor.

Major General James G. Harbord, president Radio Corporation of America.

Rev. Charles F. McFarland, general secretary Federal Council of Churches of Christ in America.

Morgan J. O'Brien, lawyer.

Dr. Henry S. Pritchett, president Carnegie Foundation.

Henry M. Robinson, president First National Bank of Los Angeles.

Elihu Root, lawyer.

Julius Rosenwald, president Sears-Roebuck Company.

Mrs. Mary Sherman, president General Federation of Women's Clubs.

General Guy E. Tripp, chairman of the Board, Westinghouse Electric and Manufacturing Company.

Owen D. Young, chairman of the Board, General Electric Company.

The navy's chief of operations and chief of staff of the army have also been invited to serve so that the army and navy may be in constant touch with the broadcasting field, and so that the broadcasting facilities may be immediately available in time of national defense.

MARY GARDEN'S



(Left to Right)
DAVID SARNOFF, M. H. Aylesworth
of Mary Garden sent via wire from Chicago her broadcast as part of the inauguration of the new broadcasting Company.

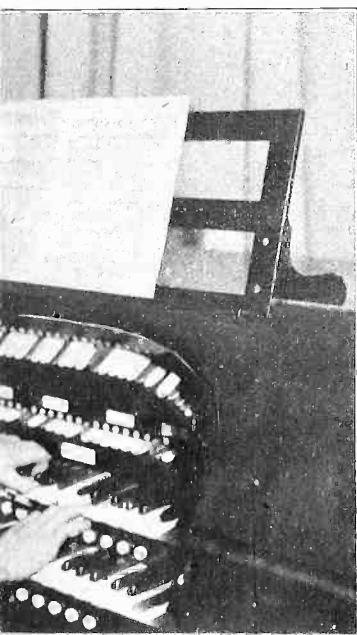


THE ORGAN is one of the most difficult the Crosley station in Cincinnati, Ohio, as perfect as possible, with the aid of a speaker and audio amplifier. Many prominent persons have complimented its wonderful tonal quality. Thousands of listeners.

PHOTO BY WIRE



Owen D. Young inspecting the photo to New York City simultaneously with program of WEAf under National Broad- management.



instruments to transmit perfectly. WLW, ever, makes sure that this transmission is ally constructed studio organ shown above sts have played on this organ and com- same opinion has also been given by the in who have written.

REALISM CARRIED FROM GRIDIRON

Use of Only Two Microphones Provides the Crowd Atmosphere to Enliven Things at the Listener's Home

"How do you do it? How many mikes do you use?"

Those are only two of the many questions fans are asking Hal and Harry, football announcers of WMAQ.

Hal and Harry give a lot of the credit for their successful broadcast to Walter R. Lindsay, chief operator, who, with the other operators, has worked out the present method.

"Not so long ago," explains Mr. Lindsay, "it was thought the more mikes the better broadcast. But experience shows that fewer mikes, properly placed, give better results."

"To make the game realistic for the fans attending the contest via radio, there are but two microphones. One is placed down near the band in the center of the stand and the other within the glass enclosed broadcast booth."

"A mixer panel is used so that the microphone near the band may be kept slightly open all the time to permit a continuous background of cheers and music for the play-by-play account of the game by the announcer, which comes through the second microphone within the booth."

The creation of the crowd atmosphere is a goal all stations seek.

"Radio Educates," Says Manufacturer

Radio has accomplished something that the phonograph has never been able to do, according to Herman Rose, president of the Shamrock Manufacturing Company of Newark, N. J.

"Radio has made people listen to talks and lectures, to schools and politics," he said.

"The phonograph has tried to teach via the record route, but has never been successful. It has tried to put humorous monologues and dialogues into the home, but they always seemed to stay in the music store. The record maker has learned through bitter experience that phonographs are not built for speech reproduction."

"But radio, scorned by Edison, has done all these things."

"Radio colleges today have a greater number of students than a combination of all the regular colleges. Radio pupils tune in their lessons with a regularity that would put the remittance college man to shame. Radio can and does teach."

Farming Broadcast Proves Successful

The Department of Agriculture announced that radio has definitely proved itself an effective vehicle for the diffusion of agricultural information. The announcement follows:

The radio has definitely proved to be an effective new vehicle for diffusion of the department's information. Since October 4, when the new Fall schedule of programs went on the air, the response from broadcasting stations and farm homes has been enthusiastic. Thousands of letters, an average of about 500 a day, asking for enrollment cards, bulletins, and information, have been flowing in to the Radio Service. Stations write to express their own appreciation and that of their audiences. Farmers, who ordinarily find little time or inclination for correspondence, write many letters of appreciation and commendation. That the department's programs are successfully holding their own in the competition on the dials is evidenced by the numerous letters received.

Set For All Soon, Says Werrenrath

The musical leadership of the world will pass from Europe to America within the next generation largely because of radio developments, according to Reinald Werrenrath, American baritone, who believes practically every American home will have a radio within the next five years.

"Radio is bringing the finest music to the smallest farm," he added, "and it is a natural result that children will absorb its beauty, and will grow up with a finer appreciation of beauty and culture than their parents."

This popular concert artist was the first of the internationally famous singers to broadcast in the Atwater Kent Sunday night concert.

"By popularizing the classics, the phonograph and radio have contributed immeasurably to America's musical appreciation," he added. "Just how far reaching the effect of radio will be it is impossible to predict. In fact, it is overwhelming when one considers the possibilities of it, and the breadth of its influence. I was told that some time in the future we shall heat our homes and run our automobiles by radio. I do not doubt it, for if any one had told us ten years ago that the radio could do what it is doing today, we should have derided the idea."

Professor to Tell How to Pronounce

The educational effect of broadcasting may be exaggerated in some quarters but there is little doubt that it has a tremendous educational bearing on language and the art of speaking correctly. As programs which come to listeners by radio appeal almost wholly to the ear, pronunciation and grammatical construction of sentences are factors in molding the habits of people in speaking. With this thought in mind Professor William Tilley, Ph.D., will be heard in the regular weekly series of Columbia University lectures from WEAf on Mondays at 7:10 p. m.

Professor Tilley, who will give hints on the phonetics of speech, studied under Henry Sweet of England, and Prof. W. Vietor, Univ. of Marburg, Germany.

TELEPHONE TOUR IS WEAFF'S STUNT

Mary Garden at Chicago, and Will Rogers, at Independence, Kan., Heard at Celebration of New Ownership—24 Stations Transmit Event

Radio listeners throughout a greater part of the United States heard Mary Garden, Will Rogers, Weber and Fields and a host of other noted artists and musical organizations in a four-hour radio program marking the formal bow of the National Broadcasting Company, the new owners of WEAFF. The program was broadcast simultaneously by twenty-two stations linked with WEAFF and WJZ in New York City. The majority of the program was presented before a microphone installed in the grand ballroom of the Hotel Waldorf-Astoria in New York City, where more than 1,000 guests made up a visible audience.

A remarkable demonstration of the use of telephone lines as an adjunct for broadcasting was displayed when, without interruption of the program, the announcer at the Waldorf introduced Mary Garden. She was standing before a microphone in her apartment studio in the Hotel Belmont, Chicago. Miss Garden immediately began her program, several soprano solos, and was heard by the audience in the Waldorf in addition to those listening into receivers.

Rogers Is Heard

Later the same demonstration was witnessed when Mr. Rogers was introduced from New York and replied with a fifteen minute program from his dressing room in Memorial Hall, Independence, Kan., where he was appearing at a show.

The broadcast was opened at 8 p.m., New York time, with an address by Merlin Hall Aylesworth, the newly elected president of the National Broadcasting Company, sponsors of the program. In a five minute talk Mr. Aylesworth told of what the new company was attempting to do in its work as a program maker.

"We are attempting, in this evening's presentation, to give you just a glimpse of the goal we will strive to reach in the make-up of programs under our supervision," he said.

In addition to Miss Garden, Mr. Rogers and Weber and Fields, the following artists and musical organizations participated: Titta Ruffo, baritone of the Metropolitan Opera Company; Harold Bauer, pianist, who was engaged while in Europe and found it necessary to advance his sailing date to arrive in time for the broadcast; the New York Symphony Orchestra, Walter Damrosch conducting; the New York Oratorio Society, Albert Stoessel conducting; the Goldman Band, Edwin Franko Goldman conducting; an Operatic Sextette, direction of Cesare Sodero, and consisting of Mesdames Genia Zielińska and Devora Nadworney and Guiseppe di Benedetto, Milo Picco, Justin Lawrie and Nino Ruisi, all artists well known to a large radio audience; a light opera company, also under the direction of Mr. Sodero, and composed of Mesdames Adele Parkhurst, and Frances Paperte and George Ohrien, Justin Lawrie, Theodore Webb and Jack Oaklev; Vincent Lopez, George Olsen, Ben

Bernie and B. A. Rolfe and their respective orchestras.

Stations In Chain

The following broadcasting stations participated in the simultaneous transmission of the program in addition to WEAFF and WJZ in New York City; WEEI, Boston; WJAR, Providence; WBZ, Springfield, (Mass.); WTAG, Worcester; WTIC, Hartford; WDRC, New Haven; WGY, Schenectady; WGR, Buffalo; WLIF, Philadelphia; WRC, Washington, (D.C.); WCSH, Portland (Me.); WCAE and KDKA, Pittsburgh; WTAM, Cleveland; WSAI, Cincinnati; WWJ, Detroit; WGN and KYW, Chicago; WHAD, Milwaukee; KSD, St. Louis; WCCO, Minneapolis-St. Paul, and WDAF, Kansas City (Mo.).

One of the surprises of the evening was the display of a photograph taken of Mary Garden while she was singing in her room in the Hotel Belmont, Chicago. It was transmitted to New York City over the telephone lines of the American Telephone and Telegraph Company and flashed on the screen as a stereopticon to the visible audience in the Waldorf before the four-hour program had ended.

Advisory Board Named

Mr. Aylesworth announced the names of the members of the Advisory Radio Council, made up of representatives of various professions and phases in public life, which will advise as to the best type of program from the public's point of view. The list:

Walter Damrosch, conductor New York Symphony Orchestra.

A. E. Alderman, president University of Virginia.

John W. Davis, lawyer.

Francis D. Farrell, president Kansas Agricultural College.

William Green, president American Federation of Labor.

Major General James G. Harbord, president Radio Corporation of America.

Rev. Charles F. McFarland, general secretary Federal Council of Churches of Christ in America.

Morgan J. O'Brien, lawyer.

Dr. Henry S. Pritchett, president Carnegie Foundation.

Henry M. Robinson, president First National Bank of Los Angeles.

Elihu Root, lawyer.

Julius Rosenwald, president Sears-Roebuck Company.

Mrs. Mary Sherman, president General Federation of Women's Clubs.

General Guy E. Tripp, chairman of the Board, Westinghouse Electric and Manufacturing Company.

Owen D. Young, chairman of the Board, General Electric Company.

The navy's chief of operations and chief of staff of the army have also been invited to serve so that the army and navy may be in constant touch with the broadcasting field, and so that the broadcasting facilities may be immediately available in time of national defense.

MARY GARDEN'S



DAVID SARNOFF, M. H. Aylesworth of Mary Garden sent via wire from Chicago her broadcast as part of the inauguration casting Comp

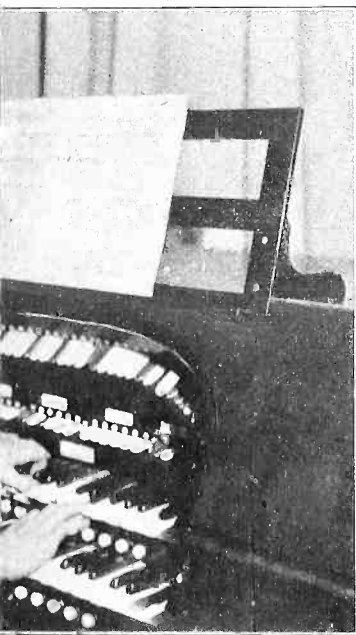


THE ORGAN is one of the most difficult the Crosley station in Cincinnati, Ohio, as perfect as possible, with the aid of a speaker and audio amplifier. Many prominent facilities may be immediately available in thousands of listeners.

PHOTO BY WIRE



Owen D. Young inspecting the photo to New York City simultaneously with program of WEAF under National Broadcast management.



instruments to transmit perfectly. WLW, ever, makes sure that this transmission is fully constructed studio organ shown above has been played on this organ and same opinion has also been given by the in who have written.

REALISM CARRIED FROM GRIDIRON

Use of Only Two Microphones Provides the Crowd Atmosphere to Enliven Things at the Listener's Home

"How do you do it? How many mikes do you use?"

Those are only two of the many questions fans are asking Hal and Harry, football announcers of WMAQ.

Hal and Harry give a lot of the credit for their successful broadcast to Walter R. Lindsay, chief operator, who, with the other operators, has worked out the present method.

"Not so long ago," explains Mr. Lindsay, "it was thought the more mikes the better broadcast. But experience shows that fewer mikes, properly placed, give better results."

"To make the game realistic for the fans attending the contest via radio, there are but two microphones. One is placed down near the band in the center of the stand and the other within the glass enclosed broadcast booth."

"A mixer panel is used so that the microphone near the band may be kept slightly open all the time to permit a continuous background of cheers and music for the play-by-play account of the game by the announcer, which comes through the second microphone within the booth."

The creation of the crowd atmosphere is a goal all stations seek.

"Radio Educates," Says Manufacturer

Radio has accomplished something that the phonograph has never been able to do, according to Herman Rose, president of the Shamrock Manufacturing Company of Newark, N. J.

"Radio has made people listen to talks and lectures, to schools and politics," he said.

"The phonograph has tried to teach via the record route, but has never been successful. It has tried to put humorous monologues and dialogues into the home, but they always seemed to stay in the music store. The record maker has learned through bitter experience that phonographs are not built for speech reproduction."

"But radio, scorned by Edison, has done all these things."

"Radio colleges today have a greater number of students than a combination of all the regular colleges. Radio pupils tune in their lessons with a regularity that would put the remittance college man to shame. Radio can and does teach."

Farming Broadcast Proves Successful

The Department of Agriculture announced that radio has definitely proved itself an effective vehicle for the diffusion of agricultural information. The announcement follows:

The radio has definitely proved to be an effective new vehicle for diffusion of the department's information. Since October 4, when the new Fall schedule of programs went on the air, the response from broadcasting stations and farm homes has been enthusiastic. Thousands of letters, an average of about 500 a day, asking for enrollment cards, bulletins, and information, have been flowing in to the Radio Service. Stations write to express their own appreciation and that of their audiences. Farmers, who ordinarily find little time or inclination for correspondence, write many letters of appreciation and commendation. That the department's programs are successfully holding their own in the competition on the dials is evidenced by the numerous letters received.

Set For All Soon, Says Werrenrath

The musical leadership of the world will pass from Europe to America within the next generation largely because of radio developments, according to Reinald Werrenrath, American baritone, who believes practically every American home will have a radio within the next five years.

"Radio is bringing the finest music to the smallest farm," he added, "and it is a natural result that children will absorb its beauty, and will grow up with a finer appreciation of beauty and culture than their parents."

This popular concert artist was the first of the internationally famous singers to broadcast in the Atwater Kent Sunday night concert.

"By popularizing the classics, the phonograph and radio have contributed immeasurably to America's musical appreciation," he added. "Just how far reaching the effect of radio will be it is impossible to predict. In fact, it is overwhelming when one considers the possibilities of it, and the breadth of its influence. I was told that some time in the future we shall heat our homes and run our automobiles by radio. I do not doubt it, for if any one had told us ten years ago that the radio could do what it is doing today, we should have derided the idea."

Professor to Tell How to Pronounce

The educational effect of broadcasting may be exaggerated in some quarters but there is little doubt that it has a tremendous educational bearing on language and the art of speaking correctly. As programs which come to listeners by radio appeal almost wholly to the ear, pronunciation and grammatical construction of sentences are factors in molding the habits of people in speaking. With this thought in mind Professor William Tilley, Ph.D., will be heard in the regular weekly series of Columbia University lectures from WEAF on Mondays at 7:10 p. m.

Professor Tilley, who will give hints on the phonetics of speech, studied under Henry Sweet of England, and Prof. W. Victor, Univ. of Marburg, Germany.

COMPLETE STATION LIST

Corrected up to November 17

Station	Location	Owner	Meters
KDGE	Barrett, Minn.	Jaren Drug Co.	232.4
KDKA	East Pittsburgh, Pa.	Westinghouse, house E. & M. Co.	309.1
KDLR	Devils Lake, N. D.	Radio Elec. Co.	231
KDYL	Salt Lake City, Ia.	Intermountain Broadcasting Corporation	236
KFAB	Lincoln, Neb.	Neb. Bur. Auto. Co.	340.7
KFAD	Phoenix, Ariz.	Elec. Equip. Co.	273
KFAF	San Jose, Cal.	A. E. Fowler	217.3
KFAU	Boise, Idaho	Indep. Sch. Dist. of Boise	280.2
KFBB	Havre, Mont.	F. A. Buttery & Co.	275
KFCB	San Diego, Cal.	Union League Club	380
KFBL	Everett, Wash.	Leese Bros.	224
KFBT	Trinidad, Cal.	School District No. 1	238
KFBU	Laramie, Wyo.	St. Matthews Cathedral	374.8
KFCB	Phoenix, Ariz.	Nielson Radio Supply Co.	238
KFDD	Boise, Idaho	St. Michael Cathedral	275.1
KFDM	Beaumont, Tex.	Magnolia Petroleum Co.	315.6
KFDX	Shreveport, La.	First Baptist Church	236.1
KFDZ	Bookings, S. D.	S. D. State College	305.9
KFEC	Portland, Ore.	Meier & Frank	252
KFEL	Denver, Colo.	E. P. O'Fallon, Inc.	254.1
KFEQ	Oak, Neb.	Scroggin & Co.	268
KFEY	Kellog, Idaho	Bunker Hill & Sullivan	238
KFEP	Moerby, Mo.	First Baptist Church	242
KFBO	Boone, Ia.	Trary Hardware Co.	236
KFBI	Wichita, Kans.	John W. Escen	287.7
KFHA	Cunison, Colo.	Western State College of Colorado	252
KFHL	Oskaloosa, Ia.	Penn. College	240
KFI	Los Angeles, Cal.	Earl C. Anthony, Inc.	467
KFIP	Portland, Ore.	Benson Polytechnic Inst.	248
KFIO	Spokane, Wash.	North Central High School	272.6
KFIO	Yakima, Wash.	First Methodist Church	256
KFIU	Juneau, Alaska	Alaska Elec. Light & Power Co.	226
KFIZ	Fond Du Lac, Wisc.	Fond Du Lac Commonwealth Reporter	273
KFJB	Marshalltown, Ia.	Marshall Electric Co.	248
KFJC	Juneau, Alaska	Alaska Elec. Light & Power Co.	218.8
KFJF	Oklahoma City, Okla.	Nat'l Radio Mfg. Co.	261
KFJJ	Astoria, Ore.	E. E. Marsh	245.8
KFJM	Grand Forks, N. D.	Univ. of N. D.	278
KFJR	Portland, Ore.	A. C. Dixon & Son	263
KFJS	Fort Dodge, Ia.	Tunwall Radio Co.	246
KFJZ	Fort Worth, Tex.	W. E. Branch	244.1
KFKA	Greeley, Colo.	Colo. State Teachers Co.	473
KFKB	Midford, Kans.	J. R. Brinkley, M.D.	431.4
KFKU	Lawrence, Kans.	Univ. of Kans.	275
KFKX	Hastings, Neb.	Westinghouse, E. & M. Co.	288.3
KFKZ	Kirkville, Mo.	Cham. of Com.	225.4
KFL	Albany, N. Y.	Cham. of Com.	234
KFLU	San Benito, Tex.	San Benito Radio Co.	236
KFLV	Rockford, Ill.	Swedish Evangelist Church	229
KFLX	Galveston, Tex.	Geo. Roy Clough	240
KFMR	Sioux City, Ia.	Morningside College	261
KFMY	Northfield, Minn.	Carlton College	336.9
KFNB	Shenandoah, Va.	Rhodery Field Seed Co.	461.3
KFOA	Seattle, Wash.	Rhodery Field Seed Co.	454.3
KFOB	Burlingame, Cal.	K. F. O. B. Inc.	225.4
KFON	Long Beach, Cal.	Echophone Radio Shop	233
KFOO	Salt Lake City, Utah	Latter Day Saints Union	236
KFOR	David City, Neb.	Tire & Electric Co.	226
KFOT	Wichita, Kans.	College Hill Radio Club	248
KFOX	Omaha, Neb.	Tex. W. E. Branch	246
KFOY	St. Paul, Minn.	Beacon Radio Service	248
KFPL	Dublin, Tex.	C. C. Baxter	252
KFFM	Greenville, Tex.	New Furniture Co.	242
KFFR	Los Angeles, Cal.	L. A. County Forestry Department	231
KFPW	Carverville, Me.	St. John's Methodist Episcopal Church	228.6
KFPY	Spokane, Wash.	Symons Investment Co.	272.6
KFOA	St. Louis, Mo.	The Principa	261
KFOB	Fort Worth, Tex.	Searchlight Publishing Co.	508.2
KFOD	Anchorage, Alaska	Anchorage Radio Club	300
KFOP	Iowa City, Ia.	G. S. Carson, Jr.	224
KFOU	Holy City, Cal.	W. D. Riker	230.6
KFQW	North Bend, Wash.	F. K. Riker	215.7
KFOZ	Hollywood, Cal.	Taft Productions	265
KFRB	Beeville, Tex.	Hall Brothers	248
KFRD	San Francisco, Cal.	City of Paris	268
KFRG	Columbia, Mo.	Stephens College	499.7
KFRW	Olympia, Wash.	Western Bldg Co.	218.8
KFSD	San Diego, Cal.	San Diego Park Evangelist Association	245.8
KFSG	Los Angeles, Cal.	Echo Park Evangelist Association	275
KFUL	Galveston, Tex.	T. Goggan & Bros.	258
KFUM	Colorado Springs, Colo.	W. D. Corley	239.9
KFUO	St. Louis, Mo.	Concordia Seminary	545.1
KFUR	Denver, Colo.	Fitzsimmons Gen. Hosp.	234
KFUS	Oakland, Cal.	Peery Building Co. Inc.	254
KFUT	Salt Lake City, Utah	Univ. of Utah	263
KFUU	Oakland, Cal.	H. C. Colburn & E. L. Mathewson	220.4
KFVD	Venice, Cal.	C. I. McWhinnie	205.4
KFVE	St. Louis, Mo.	Venson Broadcasting Corporation	236.9
KFVG	Independence, Kans.	First M. E. Church	239.1
KFVI	Houston, Tex.	Headquarters Troop, 56th Calvary	240
KFVN	Fairmont, Minn.	C. E. Bagley	227
KFVR	Denver, Colo.	Moonlight Ranch	244
KFVS	Cape Girardeau, Mo.	Cape Girardeau Station	224
KFVY	Albuquerque, N. M.	Radio Supply Co.	250
KFWB	Hollywood, Cal.	Warner Bros. Pic.	252
KFWC	San Bernardino, Cal.	L. E. Wall	291.2
KFWF	St. Louis, Mo.	St. Louis Truth Center	214.1
KFWH	Eureka, Cal.	F. Wellington Morse, Jr.	254.1
KFWI	San Francisco, Cal.	Radio Entertainment	249.2
KFWM	Oakland, Cal.	Edison Society	315.6
KFWO	Avalon, Cal.	Lawrence Mott	211.1

Station	Location	Owner	Meters
KFWU	Pineville, La.	Louisiana College	238
KFWV	Portland, Ore.	Wilbur Jerman	212.6
KFXB	Big Bear Lake, Cal.	B. C. Heller	202.6
KFXD	Dogon, Utah	Service Radio Company	205.4
KFXF	Denver, Colo.	Pikes Peak Broadcasting Company	430.1
KFXH	El Paso, Tex.	Bledsoe Radio Co.	242
KFXJ	Near Edgewater, Cal.	R. G. Howell	215.7
KFXR	Oklahoma City, Okla.	Classen Film Finishing Co.	214.2
KFY	Flagstaff, Ariz.	H. M. Costigan	205.4
KFYF	Oxnard, Cal.	Carl's Radio Dept.	214.2
KFYJ	Portland, Tex.	Houston Chronicle Publishing Company	238
KFYU	Texarkana, Tex.	Buchanan-Vaughan Co.	209.7
KFYV	Bismark, N. D.	Hoskins-Meyer, Inc.	248
KGAR	Tucson, Ariz.	Tucson Citizen	243.8
KGBS	Tucson, Ariz.	Ariz. Daily Mail	227
KGBU	Ketchikan, Alaska	Alaska Radio and Service Company	228.9
KGBW	Joplin, Mo.	Martin Brotherson	282.8
KGBX	St. Joseph, Mo.	Julius B. Abercrombie	347.8
KGBY	Shelby, Neb.	Albert C. Dunning	202.6
KGBZ	York, Neb.	Federal Live Stock Remedy Company	333.1
KGCC	Decorah, Ia.	C. W. Greenle	280.2
KGCB	Oklahoma, Okla.	Wallace Radio Inst.	331
KGCG	Newark, Ark.	Moore Motor Co.	239.9
KGCH	Wayne, Neb.	Wayne Hospital	450
KGCI	San Antonio, Tex.	Int. Radio Co.	239.9
KGCL	Seattle, Wash.	Louis Wasmer	230.6
KGCM	San Antonio, Tex.	Bridgman	210
KGCN	Concordia, Kans.	Alva E. Smith	210
KGCR	Brookings, S. D.	Cutlers Broadcasting Service	252
KGCV	Yida, Mont.	First State Bank	240
KGDA	Del Rapids, S. D.	Home Auto Co.	254
KGDJ	Cresco, Ia.	R. W. Roberts	405.2
KGDI	Seattle, Wash.	N. W. Radio Service Co.	416.5
KGO	Oakland, Cal.	General Electric Co.	361.2
KGTT	San Francisco, Cal.	Glad Tidings Temple & Bible Inst.	206.8
KGU	Honolulu, T. H.	Marion A. Mulrony	270
KGV	Portland, Ore.	Oregonian Pub. Co.	491.5
KGY	Lacey, Wash.	St. Martins College	277.6
KHJ	Los Angeles, Cal.	Times Mirror Co.	405.2
KHO	Spokane, Wash.	Louis Wasmer	394.5
KFLZ	Anita, Ia.	Atlantic Automobile Co.	272.6
KJBS	San Francisco, Cal.	J. Brunton & Sons Co.	234.2
KJR	Seattle, Wash.	Northwest Radio Serv. Co.	384.4
KLDS	Independence, Mo.	Reorganized Church of Jesus Christ	440.9
KLS	Oakland, Cal.	Warner Brothers	250
KLX	Oakland, Cal.	Times Publishing Co.	508.2
KLZ	Denver, Col.	Reynolds Radio Co.	265.3
KMA	Shenandoah, Va.	May Seed & Nursery	461.3
KMJ	Fresno, Cal.	The Fresno Bee	234.2
KMNJ	Jacy Center, Neb.	M. M. Johnson Co.	228.9
KMOX	Tacoma, Wash.	KMO, Inc.	250
KMOT	St. Louis, Mo.	Voice of St. Louis	280.2
KMTR	Los Angeles, Cal.	Echophone Co.	238
KNX	Los Angeles, Cal.	Los Angeles Express	336.9
KOA	Denver, Col.	General Electric Co.	322.4
KOAC	Corvallis, Ore.	Oregon Agriculture Coll.	280.2
KOB	State College, N. M.	New Mexico College of Agriculture	348.6
KOC	Omaha, Neb.	Omaha Central H. S.	258
KOCW	Kickashia, Okla.	Oklahoma College for Women	252
KOIL	Council Bluffs, Ia.	Moma Motor Co.	305.9
KOIN	Portland, Ore.	KOIN, Inc.	319
KOMO	Seattle, Wash.	Birt F. Fisher	305.9
KOWW	Walla Walla, Wash.	F. A. Moore	285
KPO	San Francisco, Cal.	Hale Bros. Inc.	428.3
KPPM	Prescott, Ariz.	Wilburn Radio Service	215
KPPC	Pasadena, Cal.	Pasadena Presbyterian Church	229
KPRC	Houston, Tex.	Houston Press	296.9
KPSN	Pasadena, Cal.	Star News, Pasadena, Cal.	315.6
KQW	San Jose, Cal.	First Baptist Church	333.1
KQV	Pittsburgh, Pa.	Doubleday Hill Electric Company	275
KQVC	Shreveport, La.	Caddo Radio Club	220
KRLD	Dallas, Tex.	Dallas Radio Labs.	357.1
KRSI	Seattle, Wash.	Radio Sales Corp.	499.7
KRE	Berkeley, Cal.	Berkeley Daily Gazette	256
KSAC	Manhattan, Kans.	Kansas State Agricultural College	340.7
KSBA	Shreveport, La.	W. G. Paterson	312.6
KSL	St. Louis, Mo.	Pulitzer Publishing Co.	545.1
KSEL	Pocatello, Ida.	GSEI Broadcasting Co.	260.7
KSL	Salt Lake City, Utah	Radio Service Corp.	299.8
KSMR	Santa Maria, Cal.	Santa Maria Valley R. R.	282.8
KSO	Clarinda, Ia.	A. A. Berry Seed Co.	405.2
KTAB	Oakland, Cal.	Ass. Broadcasters	302.8
KTBI	Los Angeles, Cal.	Bible Institute	293.9
KTRB	Portland, Ore.	M. E. Brown	263
KTRS	Hot Springs, Ark.	New Arlington Hotel	374.8
KTNT	Muscatoine, Ia.	Norman Baker	333.1
KTUE	Houston, Tex.	Uhalt Electric	263
KTW	Seattle, Wash.	First Presbyterian Church	454.3
KUOA	Payetteville, Ark.	Univ. of Ark.	299.8
KUOM	Missoula, Mont.	University of Mont.	243.8
KUSD	Vermillion, S. D.	University of S. D.	278
KUT	Austin, Tex.	University of Tex.	231
KVOO	Bristow, Okla.	SW Sales Corp.	374.8
KWCR	Cedar Rapids, Ia.	H. F. Parr	278
KWGR	Stockton, Cal.	Portable Wireless Telegraph Co.	248
KWKX	Kansas City, Mo.	Wilson Duncan Studios	236
KWKH	Shreveport, La.	The W. K. Henderson Iron Works and Supply Co.	312.3
KWSC	Pullman, Wash.	State College of Wash.	348.6
KWUC	San Ana, Cal.	Dr. J. W. Hancock	266.7
KWVG	Le Mars, Neb.	Western Union College	252
KWV	Brownsville, Tex.	City of Brownsville	278
KYWC	Chicago, Ill.	Westinghouse E. & M. Co.	535.4
KXRO	Seattle, Wash.	Brott Lab.	240
KZM	Oakland, Cal.	Frederic D. Allen	240
WAAD	Chincinnati, O.	Ohio Mechanical Inst.	258
WAAF	Chicago, Ill.	Daily Drivers Journal	277.6
WAAL	Newark, N. J.	Isaiah R. Nelson	263
WAAR	Omaha, Neb.	Omaha Grain Exchange	384.4
WABB	Harrisburg, Pa.	Harrisburg Radio Co.	204

Station	Location	Owner	Meters
WABC	Asheville, N. C.	Asheville Battery Co.	254
WAB	Bangor, Me.	First Universalist Church	240
WABO	Rochester, N. Y.	Hickson Elec. Co. Inc.	278
	Club		261
WABR	Toledo, O.	Scott High School	263
WABW	Wooster, O.	The College of Wooster	206.8
WABX	Mount Clemens, Mich.	H. B. Joy	246
WABY	Philadelphia, Pa.	J. Magaldi, Jr.	242
WABZ	New Orleans, La.	Colis Place Baptist Church	275.1
WADC	Akron, O.	Allen T. Simmons	258
WADF	Port Huron, Mich.	A. P. Parfet	275
WAGM	Royal Oak, Mich.	R. L. Miller	275
WAGH	Richmond Hill, N. Y.	A. H. Grebe	315.6
WAGS	Somerville, Mass.	Willow Garages, Inc.	250
WAIT	Taunton, Mass.	A. H. Waite & Co.	229
WAIU	Columbus, O.	American Ins. Union	293.9
WAMD	Minneapolis, Minn.	Raddison Radio Corp.	243.8
WAPI	Auburn, Ala.	Alabama Polytechnic Inst.	461.3
WARC	Medford, Mass.	American Radio & Research	261
WARS	Brooklyn, N. Y.	Amateur Radio Specialty Co.	295
WASH	Grand Rapids, Mich.	Baxter Launderers & Cleaners	256.3
WATT	Portland-First District, Ill.	Edison Electric	243.8
WBBA	W. Lafayette, Ind.	Purdue University	273
WBAA	Harrisburg, Pa.	Pa. State Police	275
WBAL	Baltimore, Md.	Consolidated Gas & Power Co.	245.8
WBAC	DeCar, Ill.	James Miliken University	270.1
WBAP	Fort Worth, Tex.	Cal. Pub. Inc.	475.9
WBAY	Nashville, Tenn.	Braid Elec. Co.	236.1
WBAX	Wilkes Barre, Pa.	J. H. Stenger, Jr.	256
WBBC	Brooklyn, N. Y.	P. J. Testan	249.9
WBBI	Richmond, Va.	Grace Covenant Presbyterian Church	228.9
WBMM	Chicago, Ill.	Atlas Investment	226
WBPP	Potosky, Mich.	Potosky High School	226
WBRR	Rossville, N. Y.	Peoples Pulpit Ass'n	416.4
WBWW	Norfolk, Va.	Ruffner Junior H. S.	222
WBYY	Charlestown, S. C.	Washington Light Infantry	268
WBZZ	Portland, Ill.	C. L. Carrell	215
WBZN	Chicago, Ill.	Foster & McDonnell	266
WBZY	Tilton, N. H.	Booth Radio Inst.	365
WBES	Takoma Park, Md.	Bliss Electrical School	222
WBMS	North Bergen, N. J.	G. J. Schwerer	223.7
WBNY	New York, N. Y.	Baruchrome Corp.	322.4
WBOQ	Richmond Hill, N. Y.	A. H. Grebe & Company Inc.	236
WBRC	Birmingham, Ala.	Birmingham Broadcasting Company	248
WBRE	Wilkes Barre, Pa.	Baltimore Radio Exchange	231
WBRS	Brooklyn, N. Y.	Universal Radio Mfg. Company	394
WBST	Charlotte, N. C.	C. Cham. of Com.	275
WBZ	Springfield, Mass.	Westinghouse E. & M. Co.	333.1
WBZA	Boston, Mass.	Westinghouse E. & M. Co.	333.1
WCAC	Mansfield, Conn.	Conn. Agri. College	275
WCAN	Canton, N. Y.	St. Lawrence University	263
WCAD	Pittsburgh, Pa.	Kaufman & Baer Co.	461.3
WCAB	Columbus, Ohio	Univ. of Ohio	265.3
WCAL	University Place, Neb.	Neb. Wesleyan University	254
WCAL	Northfield, Minn.	St. Olaf College	336.9
WCAM	Camden, N. J.	City of Camden	336.9
WCAP	Baltimore, Md.	Brager of Baltimore	275
WCAR	San Antonio, Tex.	Southern Radio Corporation	268
WCAT	Rapid City, S. D.	School of Mines	240
WCAU	Philadelphia, Pa.	Universal Bldg. Co.	278
WCAX	Burlington, Vt.	University of Vermont	245.8
WCAY	Carthage, Ill.	Carthage College	245.8
WCBD	Allentown, Pa.	C. W. Heimbach	254
WCBE	Don, Ill.	Wilber Glenn Voliva	344.6
WCBB	Oxford, Miss.	University of Miss.	242
WCBM	Baltimore, Md.	Hof. Chaucer	229
WCBP	Portland, R. I.	C. H. Mosier	297.7
WCCO	Anoka, Minn.	Washburn Crosby Co.	416.4
WCFL	Chicago, Ill.	Chicago Fed. of Labor	491.5
WCFT	Tullahoma, Tenn.	Knights of Pythias Home	250.2
WCGU	Lakewood, N. J.	C. G. Ungar	350.6
WCLO	Camp Lake, Wis.	E. Whitmore	231
WCLS	Joliet, Ill.	H. M. Couch	214
WCMA	Culver, Ind.	Culver Military Academy	258.5
WCOW	Pensacola, Fla.	City of Pensacola	222.1
WCRA	Chicago, Ill.	C. R. White	416.4
WCSC	Portland, Me.	H. R. Rines	499.7
WCSS	Springfield, O.	Wittenton College	248
WCWK	Fort Wayne, Ind.	C. W. Keen	234.2
WCWS	Portland, Mass.	C. W. Seiden	209.7
WCX	Pontiac, Mich.	Detroit Free Press	516.9
WJR	Pontiac, Mich.	Jewett Radio & Phonograph Co.	516.9
WDAD	Nashville, Tenn.	Dads Automobile Accessories, Inc.	226
WDAA	Tampa, Fla.	Tampa Daily Times	273
WDAF	Kansas City, Mo.	Kansas City Star	365.6
WDAH	Alexandria, Tex.	J. L. Martin	263
WDAL	Pasadena, Tex.	Trinity Methodist Ch.	267.7
WDAY	Fargo, D.	Radio Electric Corp.	260.7
WDBE	Atlanta, Ga.	Gilbert Electric Co.	270
WDBJ	Roanoke, Va.	Richardson, Wayland Elec. Corp.	228.9
WDBK	Cleveland, O.	M. F. Broz	228
WDBO	Winter Park, Fla.	Rollins College	240
WDEL	Kinston, N. Y.	Kingston Radio Club	232.4
WDEI	Wilmington, Del.	Wilmington Electric Specialty Company	265.3
WDGY	Minneapolis, Minn.	D. G. W. Young	363
WDOD	Chattanooga, Tenn.	Chattanooga Radio Co. Inc.	256
WDRC	New Haven, Conn.	Doolittle Radio Corporation	268
WDXL	Grosse Pointe, Mich.	DXL Radio Corp.	296.9
WDWF	Cranston, R. I.	D. W. Flinn, Inc.	440.9
WDZ	Tuscola, Ill.	James H. Bash	278
WEAF	N. Y. City	National Bldg. Co. of Am.	491
WEAI	Ithaca, N. Y.	Cornell University	491

Station	Location	Owner	Meters	Station	Location	Owner	Meters	Station	Location	Owner	Meters
WEAM—North Plainfield, N. J., Borough of North Plainfield			261	WJAG—Norfolk, Neb., Norfolk Daily News			352.7	WOAN—Lawrenceburg, Tenn., I. D. Vaughn			282.8
WEAN—Providence, R. I., The Shepard Co.			367	WJAK—Kokomo, Ind., Kokomo Tribune			254.1	WOAW—Omaha, Neb., Woodmen of the World			240.0
WEAO—Columbus, O., Ohio State University			293.9	WJAM—Cedar Rapids, Ia., D. M. Cham			268	WOAX—Trenton, N. J., Woodmen of the World			240.0
WEAR—Cleveland, O., Willard Storage Battery Company			389.4	WJAR—Providence, R. I., The Outlet Co.			305.9	WOBB—Chicago, Ill., Longueurs Engrg. Con'n.			555.2
WEAU—Sioux City, Ia., Davidson Bros. Co.			275	WJAS—Pittsburg, Pa., Pittsburgh Radio Supply House			275	WOC—Davenport, Ia., Palmer School of Chiropractic			483.6
WEBC—Superior, Wisc., W. C. Bridges			242	WJAX—Jacksonville, Fla., City of Jacksonville			336.9	WOCB—Orlando Bldg. Co., Orlando, Fla.			293.7
WEBH—Chicago, Ill., Edgewater Beach Hotel			370.2	WJAZ—Mount Prospect, Ill., Zenith Radio Corp.			322.4	WCL—Jamestown, N. Y., A. H. Newton			275.1
WEBJ—New York, N. Y., Third Ave. R. R. Co.			273	WJBA—Joliet, Ill., D. H. Lentz, Jr.			258.8	WODA—Patterson, N. J., O'Dea Temple of Music			190.9
WEBL—Fortable, R. C. A. Show			236	WJBC—St. Petersburg, Fla., J. J. Jones			251	WOI—Ames, Ia., Iowa State College			270
WEBC—Harrisburgh, Pa., J. J. Jones			236	WJBB—La Salle, Ill., Hummer Furniture Co.			218.8	WOK—Homewood, Ill., Neutrowood Radio Mfg. Co.			217.3
WEBR—Buffalo, N. Y., H. H. Howell			244	WJBI—Red Bank, N. J., R. S. Johnson			218.8	WOMT—Peekskill, N. Y., H. E. Smith			254.1
WEBW—Beloit, Wisc., Beloit College			238	WJBK—Ypsilanti, Mich., E. F. Goodwin			253	WOP—Philadelphia, Pa., J. W. Winkler			508.2
WEBZ—Savannah, Ga., Savannah Radio Corp.			263	WJBL—Decatur, Ill., Wm. Gushard Dry Goods Co.			270	WOOD—Grand Rapids, Mich., Grand Radio Co.			241.8
WEDC—Chicago, Ill., Emil Denmark Corp.			422.3	WJBO—New Orleans, La., Jenson			237.1	WOQ—Kansas City, Mo., Unity School			278
WEEI—Boston, Mass., Edison Electric Ill. Co.			202.6	WJBT—Chicago, Ill., John S. Boyd			468.5	WOR—Newark, N. J., L. Hamberger & Co.			405.4
WEHC—Chicago, Ill., O. Fordham			202.6	WJBW—Lewistown, Pa., Bucknell University			211.1	WORD—Batavia, Ill., Peoples Pulpit Association			275
WEMC—Jerrin Springs, Mich., Emanuel Miss. College			315.6	WJBV—Woodhaven, N. Y., Union Course Club			388.3	WOS—Jefferson City, Mo., State Marketing Bureau			440.9
WENR—Chicago, Ill., All-American Radio Corp.			266	WJBW—New Orleans, La., C. Carlson, Jr.			270.1	WOWO—Fort Wayne, Ind., Main Automobile Supply Co.			227
WEW—St. Louis, Mo., St. Louis University			360	WJBX—Osterville, Mass., Henderson & Ross			280	WPAC—Agricultural College, N. D., N. D. Agricultural			275
WFAA—Dallas, Tex., Dallas News & Dallas Journal			475.9	WJBY—Gadsden, Ala., Elec. Construction Co.			370.2	WPAC—Cliffside, N. J., (See WJAO)			361.2
WFAM—St. Cloud, Minn., Publishing Co.			273	WJCB—Cleveland, Ill., Local Order of Moose			260	WPCB—Chicago, Ill., North Shore Congregational Church			258
WFAV—Lincoln, Neb., University of Neb.			275	WJCR—Pontiac, Mich., Jewett Radio & Phonograph Co., and The Detroit Free Press			516.9	WPCH—N. Y. C., N. Y., Concourse Radio Corp.			273
WFBC—Knoxville, Tenn., First Baptist Church			250	WJCU—New York City, N. Y., B. Ross			516.9	WPDQ—Buffalo, N. Y., Hiram L. Turner			305.4
WFBE—Cinc., O., Garfield Place Hotel			232.4	WJCY—New York, N. Y., Nat. Broadcasting Co. of America			406.2	WPG—Atlantic City, N. J., Municipality of Atlantic City			299.8
WFBG—Altoona, Pa., W. F. Gable Co.			278	WJZ—Bound Brook, N. J., Nat. Bldg. Co. of Amer.			454.3	WPRC—Harrisburgh, Pa., Wilson Printing & Radio Co.			215.7
WFBJ—Collegeville, Minn., St. John's University			236	WKAF—Milwaukee, Wisc., WKAF Broadcasting Corp.			261	WPSC—State College, Pa., Pa. State College			261
WFBF—Syracuse, N. Y., Onondaga Hotel			268	WKAQ—San Juan, P. R., Radio Corporation of Porto Rico			340.7	WQAA—Parkersburg, Pa., H. A. Beale, Jr.			230
WFBK—Indianapolis, Ind., Albert H. L. Co.			268	WKAC—East Lansing, Mich., Michigan State College			285.8	WQAC—Amarillo, Tex., Gish Radio Service			234
WFBK—Baltimore, Md., Fifth Infantry, National Guard			254	WKAR—Laconia, N. H., Laconia Radio Club			213.7	WQAE—Springfield, Vt., Moore Radio News Station			246
WFBZ—Galesburg, Ill., Knox College			254	WKBA—Chicago, Ill., Arrow Battery Co.			209.7	WQAM—Miami, Fla., Electrical Equipment Co.			285.5
WFCL—Pawtucket, R. I., Frank Crook, Inc.			229	WKBB—Joliet, Ill., Sanders Brothers			282.8	WQAN—Scranton, Pa., North Shore Congregational Church			250
WFDF—Ft. Smith, Mich., Frank D. allain			234	WKBC—Birmingham, Ala., H. L. Ansley			235	WQAO—Cliffside, N. J., Calvary Baptist Church (WPAP used when Palisade Amusement Park Program is on)			361.2
WFL—Philadelphia, Pa., Strawbridge & Clothier			294.5	WKBD—Jersey City, N. J., F. V. Bremer			215	WQJ—Chicago, Ill., Calumet Co.			447.5
WFLC—Chicago, Ill., C. S. Crawford			317.3	WKBE—Webster, Mass., K. & R. Electric Co.			270.1	WRAF—Lafayette, Ind., Radio Club, Inc.			224
WFLR—Brooklyn, N. Y., R. M. Lacey			205.4	WKBF—Indianapolis, Ind., N. D. Watson			241	WRAE—Providence, R. I., Stanley N. Real			235
WGAL—Lancaster, Pa., Lancaster Electric Supply and Construction Co.			248	WKBG—Portland, Ill., Local Order of Moose			35.7	WRAM—Galesburg, Ill., Lombard College			244
WGCB—Freeport, N. Y., H. H. Carman			243.8	WKBK—L. Cross, Wisc., Callaway Music			249.9	WRAP—Reading, Pa., Avenue Radio & Electric Shop			218
WGB—Memphis, Tenn., First Baptist Church			278	WKBI—Chicago, Ill., F. L. Schoenwolf			220.4	WRAX—Philadelphia, Pa., Beraach Ch. Inc.			267.7
WGBS—Evanston, Ill., Finkle Furniture Co.			236.1	WKBJ—St. Petersburg, Fla., Gospel Tabernacle, Inc.			280	WRBC—Valparaiso, Ind., Immanuel Lutheran Church			278
WGBS—Scranton, Pa., Scranton Bldg. Inc.			239.9	WKBL—Monroe, Mich., Monroa Radio Mfg. Co.			252	WRD—Washington, D. C., Nat. Bldg. Co. of Amer.			468.5
WGBS—Astoria, La., N. Y., Gimbel Bros.			315.6	WKBM—Youngstown, O., Radio Elec. Serv. Co.			312.6	WRD—Raleigh, N. C., Wayne Radio Co.			252
WGBU—Fultford-by-the-Sea, Fla., Florida Cities Finance Company			278	WKBP—Jersey City, N. J., Camith Corp.			309.1	WREC—Coldwater, Miss., Wooten's Radio Shop			254
WCBX—Oreño, Me., University of Me.			234.2	WKBB—New York City, Starlight Amusement Park			285	WREO—Lansing, Mich., Reo Motor Car Co.			225.5
WCGP—Newark, N. J., May Radio Bldg. Corp.			252	WKBR—Auburn, N. Y., Chas. J. Hieser			256.3	WRES—Waltham, Mass., H. L. Sawyer			300
WGES—Chicago, Ill., Oak Leaves Broadcasting Corporation			315.6	WKRS—Galesburg, Ill., P. N. Nelson			361.2	WRHF—Washington, D. C., Washington Radio Hospital			256
WGHB—Clearwater, Fla., Fort Harrison Hotel			265.3	WKBT—New Orleans, La., 1st Baptist Church			249	WRHM—Minneapolis, Minn., Rosedale Hospital			252
WGHP—Detroit, Mich., G. H. Phelps, Inc.			270	WKBY—Brookville, Ind., Knox Battery & Electric			236.1	WRK—Hamilton, O., Doron Brothers Electric Co.			270
WGM—Jeanette, Pa., Verne & Elton Spencer			372	WKBY—Danville, Pa., (Portable) F. Duick			220	WRM—Urbana, Ill., University of Ill.			272
WGMU—Portland, N. Y., A. H. Grebe & Co.			236	WKBB—Buffalo, N. Y., Chas. H. Bell			362.5	WRMU—Motor Yacht "MU-I," A. H. Grebe & Co.			236
WGN—Chicago, Ill., Chicago Tribune			302.8	WKBD—Ludington, Mich., K. L. Ashbacher			326.3	WRNY—N. Y. C., Experimenter Publishing Co.			373.8
WGR—Buffalo, N. Y., Federal Tel. & Tel. Co.			319	WKDR—Kenosha, Wisc., E. A. Dato			428.3	WRR—Dallas, Tex., City of Dallas			246
WGST—Atlanta, Ga., School of Tech.			270	WKJC—Lancaster, Pa., Kirk Johnson & Co.			258.5	WRST—Bay Shore, N. Y., Radiotell Manufacturing Co., Inc.			215.7
GWGE—Milwaukee, Wisc., Radiotec. Corp.			384.4	WKRC—Cincinnati, O., The Kodak Radio Co.			423.3	WRVA—Richmond, Va., Larus & Bro. Co., Inc.			256
WGY—Schenectady, N. Y., G. E. Co.			379.5	WKY—Oklahoma City, Okla., R. C. Hull & N. S. Richards			275	WSAI—Cincinnati, O., United States Playing Card Co.			325.9
WHA—Madison, Wisc., University of Wisc.			535.4	WLAL—Tulsa, Okla., First Baptist Church			250	WSAJ—New York City, Pa., Grove City College			221
WHAD—Milwaukee, Wisc., Marquette Univ.			275	WLAP—Louisville, Ky., W. F. Jordan			275	WSAN—Allentown, Pa., Allentown Call Publishing Co., Inc.			229
WHAM—Rochester, N. Y., Eastman School of Music			273	WLB—Minneapolis, Minn., University of Minnesota			278	WSAR—Fall River, Mass., Doughty & Welch Electric Co.			254.1
WHAP—New York, N. Y., Wm. H. Taylor Finance Corp.			431	WLBC—Muncie, Ind., D. A. Burton			223.7	WSAY—Houston, Tex., Clifford W. Vick			247.8
WHAR—Atlantic City, N. J., F. D. Cooks Sons			275	WLBE—Bklyn, N. Y., J. H. Fruitman			330.6	WSAX—Chicago, Ill., Zenith Radio Corporation			268
WHAS—Louisville, Ky., Courier Journal & Louisville Times			399.8	WLBI—Stevens Point, Wisc., Wisc. Department of Markets			278	WSBY—Pomeroy, O., Chas. Electric Shop			244
WHAZ—Troy, N. Y., Rensselaer Polytechnic Inst.			379.5	WLBI—Eligible, Ill., J. J. Jones			308.8	WSB—Atlanta, Ga., Atlanta Journal			428.3
WHB—Kansas City, Mo., Sweeney School Co.			365.6	WLIT—Philadelphia, Pa., Lit Brothers			394.5	WSBC—Chicago, Ill., World Battery Co.			288.3
WHBA—Oil City, Pa., C. S. Crawford			254	WLJ—Cret, Ill., Sears Roebuck Co.			344.5	WSBT—St. Louis, Mo., Stix Baer & Fuller			273
WHBC—Canton, O., Rev. E. P. Graham			254	WLS—Cret, Ill., Sears Roebuck Co.			344.5	WSBT—South Bend, Ind., South Bend Tribune			315
WHBD—Bellevue, O., Chamber of Com.			222.1	WLSL—Cranston, R. I., The Lincoln Studios, Inc.			440.9	WSDA—N. Y. C., Seventh Day Adventist Ch.			263
WHBF—Rock Island, Ill., Beardsley Sp. Co.			222	WLTS—Chicago, Ill., Lane Technical High School			258	WSKC—Bay City, Mich., World's Star Knitting Co.			261
WHBG—Harrisburgh, Pa., John S. Skane			231	WLW—Harrison, N. Y., The Crosley Radio Corp.			422.3	WSM—Nashville, Tenn., National Life & Accident Insurance Co.			282.8
WHBI—Portland, Ninth District, C. L. Carrell			215.7	WLWL—N. Y. C., Catholic Fathers			384.4	WSMZ—New Orleans, La., Sangser Amusement Co. & Maison Blanche Co.			319
WHBM—Portland, Ninth District, C. L. Carrell			215.7	WMAC—Cazenovia, N. Y., C. B. Meredith Corp.			275	WSMH—Owosso, Mich., Shattuck Music House			240
WHBN—St. Petersburg, Fla., First Avenue M. E. Church			238	WMAD—Dartmouth, Mass., Round Hills Radio Corp.			440.9	WSMK—Dayton, O., S. M. K. Radio Corp.			275
WHBP—Johnstown, Pa., Johnstown Auto			238	WMAL—Lockport, N. Y., Norton Laboratories			266	WSMO—Milwaukee, Wisc., School of Engineering of Milwaukee			246
WHBO—Memphis, Tenn., St. Johns M. E. Ch.			233	WMAL—Washington, D. C., M. A. Leese Optical Co.			212.6	WSH—Hamilton, O., H. W. Fahlander			252
WHBU—Anderson, Ind., Riviera Theatre & Bings Clothing			218.8	WMAN—Columbus, O., Haskett Radio Station			278	WSSH—Boston, Mass., Tremont Temple Baptist Church			260.7
WHBW—Philadelphia, Pa., D. R. Kienzie			215.7	WMAN—Chicago, Ill., Chicago Daily News			447.5	WSUI—Iowa City, Iowa, State University of Ia.			483.6
WHBY—West De Pere, Wisc., St. Norberts College			249.9	WMAY—St. Louis, Mo., Kings Highway Fresh. Church			243	WSVS—Buffalo, N. Y., Seneca Vocational Sch.			218.8
WHDI—Minneapolis, Minn., W. H. Dunwoody Institute			278	WMBA—Macon, Ga., Mercer University			261	WTAB—Fall River, Mass., Fall River Daily			266
WHEC—Rochester, N. Y., Hickson Electric Co., Inc.			258	WMBB—Chicago, Ill., American Bond & Mortgage Co.			250	WTAD—Carthage, Ill., J. C. Compton			236
WHFC—Chicago, Ill., Hotel Flanders			285.5	WMBC—Detroit, Mich., Michigan Broadcasting Co., Inc.			256	WTAG—Worcester, Mass., Worcester Telegram			545.1
WHK—Cleveland, O., Radio Air Service Corp.			272.6	WMBF—Miami Beach, Fla., Fleetwood Hotel Corp.			384.4	WTAL—Toledo, O., Toledo Radio & Electric Co.			252
WHN—New York, N. Y., Geo. Schubel			361.2	WMBI—Chicago, Ill., Moody Bible Institute			288.3	WTAM—Cleveland, O., Willard Storage Battery Co.			389.4
WHO—Des Moines, Ia., Bankers Life Co.			526	WMSC—N. Y. C., Madison Square Garden Broadcasting Corp.			302.8	WTAP—Eau Claire, Wisc., C. S. Van Gordon			254.1
WHOG—Huntington, Ind., Huntington Bldg. Association			241.8	WMNB—Boston, Mass., Shepard Stores			280.2	WTAW—College Station, Tex., Agricultural Mechanical College of Texas			270
WHT—Deerfield, Ill., Radiophone Bldg. Corp.			399.8	WMNC—Boston, Mass., Shepard Stores			430.1	WTAX—Streator, Ill., Williams Hardware Co.			231
WIAD—Philadelphia, Pa., Howard R. Miller			250	WMND—Norman, Okla., University of Okla.			254	WTZ—Lambertville, N. J., Thomas J. McGuire			261
WIAS—Burlington, La., Home Electric			254	WNAL—Omaha, Neb., Omaha Central High School			258	WTRC—N. Y. C., 20th Dist. Rec. Club			475.9
WIBA—Madison, Wisc., Capital Times-Strand Theatre			236.1	WNAT—Philadelphia, Pa., Lennig Brothers Co.			250	WVAE—Plainfield, Ill., Electric Park			384.4
WIBC—Elkhart, Pa., St. Paul's Protestant Episcopal Church			222	WNAX—Yankton, S. D., Dakota Radio Apparatus Co.			244	WWL—New Orleans, La., Loyola University			275
WIBH—New Bedford, Mass., Elite Radio Stores			209.7	WNBH—New Bedford, Mass., New Bedford Hotel			217.8	WWRL—Woodside, N. Y., Woodside Radio Laboratories			258.5
WIBI—Flushing, L. I., N. Y., F. B. Zittel, Jr.			218.8	WNJ—Newark, N. J., Radio Shop of Newark			252				
WIBJ—Portland, Ill., C. L. Carrell			215.7	WNOX—Knoxville, Tenn., Peoples Tel. & Tel. Co.			267.7				
WIBM—Portland, Ill., B. Maine			215.7	WNRC—Greensboro, N. C., W. M. Nelson			233.7				
WIBN—Chicago, Ill., Nelson Brothers			226	WNYC—New York, N. Y., W. M. Nelson			233.7				
WIBR—Weirton, W. Va., Thurman A. Owings			246	WYOA—San Antonio, Tex., Sou. Equip. Co.			394.5				
WIBS—Elizabeth, N. J., Thos. Hunter			202.6								
WIBU—Logansport, Wisc., The Electric Farm			222								
WIBW—Poynette, Ind., Dr. D. L. Dill			220								
WIBX—Utica, N. Y., WIBX, Inc.			205.4								
WICC—Bridgeport, Conn., Bridgeport Bldg. Sta.			285								
WIEZ—Montgomery, Ala., A. D. Drum			273								
WIS—St. Louis Mo., Benson Radio Co.			273								
WISB—Weirton, W. Va., Fisher Co.			247.8								
WIP—Philadelphia, Pa., Gimbel Bros.			508.2								
WJAD—Waco, Tex., Jackson's Radio Engineering Laboratories			352.7								
WJAF—Ferndale, Mich., J. S. Fernberg Radio Co.			407								

Radio University

A FREE Question and Answer Department conducted by RADIO WORLD for its yearly subscribers only, by its staff of Experts. Address: Radio University, RADIO WORLD, 145 West 45th St., New York City.

When writing for information give your Radio University subscription number.

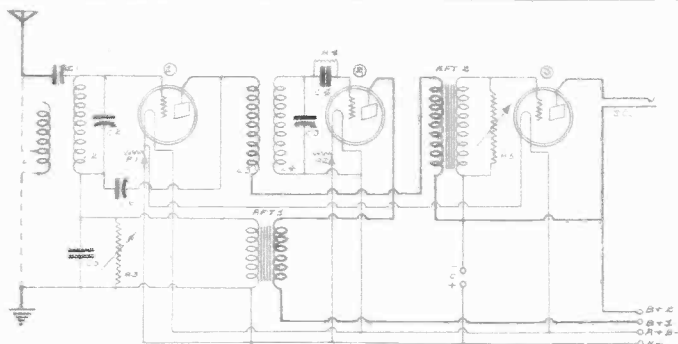


FIG. 468

The circuit diagram of the 3-tube reflex, requested by Leon Menden.

I HAVE two Electrad type B Royalty variable high resistances, a Samson 6 to 1 and a Samson 3 to 1 AFT, and two .00025 mfd variable condensers. Please give the circuit diagram of a 3-tube receiver, employing these parts, stating coil data.—Leon Menden, Morristown, N. J.

Fig. 468 shows the circuit diagram of such a receiver. It is a reflex, using one of the transformers (6 to 1, AFT 1) in the reflex stage and the other (3 to 1, AFT 2) in the standard audio stage. R3 and R5 are the Electrad resistances. They are used to control the volume. L1 and L3, the primaries, consist of 15 turns. L2 and L4, the secondaries, consist of 65 turns. Each primary and secondary is wound on a 3" diameter tubing using No. 22 double cotton covered wire. About a 1/4" space can be left between the two primary windings. C1 is a .00005 mfd variable condenser, which is used if the primary winding, L1, is not used. That is, the connecting of this condenser and primary winding is experimental. C6 is a .00004 mfd variable condenser. C2 and C3 are the .00025 mfd variable condensers. C5 is a .0001 mfd fixed condenser. The filament of the detector tube is controlled by a 20 ohm rheostat, while the filaments of the RF-AF and the straight audio tubes is controlled by a 10 ohm rheostat. C4 is a .00025 mfd grid condenser. R4 is a 2 megohm grid leak. SCJ is a single circuit jack. The .01A tubes should be used for best results. If higher than 90 volts are used on the audio tubes, then the B plus 2 lead should be broken, since higher voltage will cause the first tube to oscillate beyond control. A 4.5 volt C battery should be used for the 90 volt battery. A 9 volt C battery, if 135 volts B are used. Another stage of transformer or any type of audio frequency amplification may be added to the output. Be sure that all the grid returns are properly made, also the rotary section of the condensers. The filament control is not critical, neither is the tuning. If it is found that the volume is a bit low, then it is suggested that the resistance in the reflex transformer AFT1, be cut out. The parts for this set can be mounted on a baseboard 17" long and 6" wide. This will require a 7x18" panel and cabinet. The coils should either be placed at right angles at or about 5" from each other. Keep the grid and plate leads away from each other. If they have to run parallel, then space them about 8". It is a good idea, if they run parallel close to each other, to place a small copper shield around the wire and ground the shield. Care should be taken that the

shield does not touch the lead, though. The shield can be cylindrical or square, about 3/4" around the entire inner surface. A light switch can be installed also, the terminals for the light being connected across the A leads, and the switch in series with an A lead, before the connections to the light.

I HAVE a 1:1 ratio transformer which I wish to use as a means of coupling the loud speaker to the plate output. The terminals are marked IN1P and IN2B and OUT1 and OUT2. How should it be connected?—Norman Stone, West New York, N. J.

The IN1P post is connected to the P post of the last socket. The IN2B post is connected to the B plus amplifier post. The OUT1 post is connected to the minus speaker cord while the OUT2 post is connected to the plus speaker cord. Try changing these leads around for louder signals.

I WOULD like to have the baseboard layout of a 2-stage transformer coupled audio frequency amplifier unit, using rheostats in each of the filament circuits, Fahnestock clips for all battery, input and output connections, unshielded transformers and standard shell type sockets—Meyer Clerks, Boston, Mass.

Such a layout is shown in Fig. 469. The transformers, due to the fact that they are unshielded, are placed at right angles. The sockets are placed in between the AFT, with the rheostats directly in front. The filament posts of the sockets are in front of the rheostats. The P and B posts of the input transformer are near the input posts. The G and F posts of this AFT is placed near the G and F posts of the socket. The P and P posts of the second AFT are placed toward the rear, the G and F posts being near the front. Provision is also made for C battery connection. These clips should be placed a fair distance away from each other so that there is no possibility of shorting them. This can be averted by bolting the clips down tightly. Flexible or solid wire may be used for wiring. The board should be 12x8".

I HAVE built the 4-tube reflex receiver shown on page 12, Radio University columns of the Sept. 11 issue of Radio World and have obtained wonderful results. I would like to know if it is possible to add another stage of transformer coupled audio frequency amplification. If so should a low ratio, about 2 to 1 type be used? Is any precaution necessary to

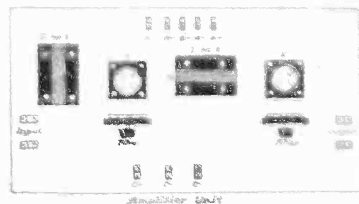


FIG. 469

The experimental layout of the 2-stage transformer coupled audio frequency amplifier unit.

prevent distortion?—Henry Mardens, Pittsburgh, Pa.

Yes, another stage of audio can be used, provided you use the low ratio transformer you state. It is possible that distortion will prevail. This can be prevented by the use of a power tube, with the proper C bias. A variable resistor, or across the secondary winding, such as used in the reflex shown in Fig. 468 may also help. The filament control can be automatic.

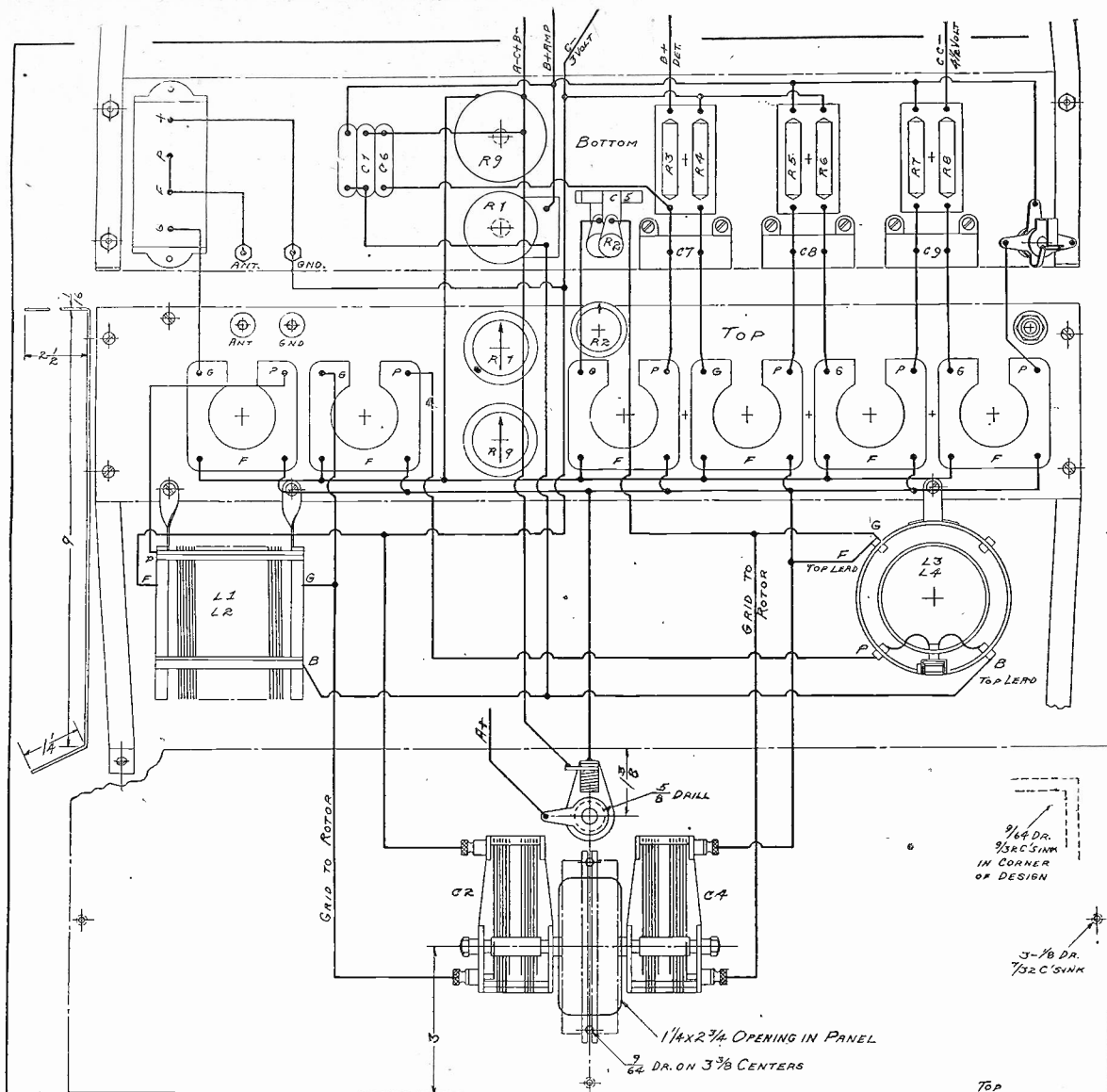
I HAVE two .00035 mfd variable condensers. I would like to build the 2-tube set shown in Fig. 349, Radio University columns of the May 29 issue of Radio World. Please give the coil data, using solenoid forms, 4" in diameter, with No. 20 single cotton covered wire—Reddy Grant, Hunter, N. Y.

The antenna coil consists of 40 turns, tapped at the 10th turn. The primary of the inter-stage coupler consists of 10 turns. The secondary consists of 35 turns. Space 1/4" between windings.

I HAVE a pair of tuned radio frequency transformers, both of which have 15 turn primaries and 55 turn secondaries, wound on 2 3/4" diameter tubings, using No. 24 double cotton covered wire with a 1/8" space between the primary and secondary windings. I would like to use these in the 3-tube regenerative receiver shown on page 11 of the Aug. 7 issue of Radio World. Please give the proper information, so that they may be used. I am going to keep the variometer in the set.—Bob Luster, Plainfield, N. J.

The secondaries of these coils are for .0005 mfd variable condensers. The antenna is connected to the beginning of the primary winding of one of the RFT. The end of this winding is brought to the ground. The beginning of the secondary winding of this same RFT is brought to the A minus and to the rotary plates of a .0005 mfd condenser. The end of this winding is brought to the stationary plate post of the condenser and to the G post of the socket. The beginning of the primary winding of the other RFT is brought to the P post of the first socket. The end of this winding is brought to the B plus 67 1/2 volt post. The beginning of the secondary winding is brought to the rotary plate post of the second .0005 mfd variable condenser and to the A plus post. The end of this winding is brought to the stationary plate post of the condenser and to one terminal of the grid leak and condenser. R1, C2. No other change is necessary in the wiring. Be sure that the end of the primary windings are near to the beginning of the secondary windings. If the end of the primary winding is near to the end of the secondary winding, then bring these secondary leads to the low potential points, instead of to the high potential points.

COULD I build the 5-tube set, shown in Fig. 371, Radio University columns, July 17 issue of Radio World, with a stage of tuned radio frequency amplification, instead of the untuned stage, as diagrammed? How shall I make the coil



(Design Copyright 1926)

FIG. 470

The picture diagram of the wiring of the Bernard 6-tube set. The subpanel or socket strip is shown in top and bottom views. The panel is shown folded back, so to speak, to align with the upper diagram. The C3 fixed condenser, top left, is unmarked.

and what variable condenser should I use?—Herman Shad, South Bend, Ind.

Yes. Very good results will be obtained with this scheme. The primary consists of 10 turns. The secondary consists of 50 turns. Both should be wound on a 3" diameter tubing, using No. 22 double cotton covered wire. Shunt this secondary with a .0005 mfd. variable condenser. The wiring connections as per diagram, are used. Be sure to bring the grid return to the A minus post.

* * *

PLEASE tell me whether self-oscillation on high wavelengths is to be expected on the Bernard receiver (Oct. 16 issue), prior to neutralization.—J. P. Marr, El Paso, Texas.

While most persons expect that, prior to the balancing of a receiver, that there will be self-oscillation on the lower wavelengths, it is quite possible that in the Bernard (Fig. 470) not only will this exist, but also there will be self-oscillation on the higher wavelengths, even at the very top part of the wavelength tuning scale. Since the receiver has a fixed radio frequency transformer in the first stage, nor-

mally and Acme R3, with high wavelength peak, the amplification is built up for the benefit of the longer waves, to

give a rather uniform amplification over the entire tuning scale. (The R4 may be (Continued on page 23))

Join RADIO WORLD'S University Club

And Get Free Question and Answer Service for the Coming 52 Weeks
This Service for Yearly Subscribers ONLY

* Have your name entered on our subscription and University lists by special number. Put this number on the outside of the forwarding envelope (not the enclosed return envelope) and also put at the head of your queries. If already a subscriber, send \$6 for renewal from close of present subscription and your name will be entered in Radio University. No other premium given with this offer.

[In sending in your queries to the University Department please paragraph them so that the reply can be written under or alongside of each query. Write on one side of sheet only. Always give your university number.]

RADIO WORLD, 145 West 45th Street, New York City.

Enclosed find \$6.00 for RADIO WORLD for one year (52 Nos.) and also enter my name on the list of members of RADIO WORLD'S University Club, which gives me free information in your Radio University Department for 52 ensuing weeks, and send me my number indicating membership.

Name
Street
City and State

THE RADIO TRADE

Freshman Ahead of 1925 by 38%

The Chas. Freshman Co., Inc. report net sales for October of \$1,482,913, an increase of 15 per cent over net sales of October 1925, which were \$1,290,174. Charles Freshman, president, further reports that the total net sales from June 1 to October 31, 1926, showed an increase of 38 per cent over the corresponding period of 1925.

In spite of this substantial increase it is pointed out by Mr. Freshman that the sales during October were greatly handicapped through the company's inability to get sufficient console cabinets to meet the demand of the trade. In order to eliminate this condition in the future the company is seriously considering the acquisition of one or more furniture factories.

Daven Becomes Set Maker, Too

W. H. Frasse, president of the Daven Radio Corporation, announced the purchase of the controlling interest of the stock of the Port Manufacturing Company, manufacturers of the Daven Bass Note Circuit. The purchase price was not divulged.

Mr. Frasse stated that the Daven Radio Corporation realized soon after granting a license to the Port Manufacturing Company that they had made a mistake. The business of the Port Company far exceeded anyone's expectations, due to the popularity of the Bass Note Set. The only way to get control of the license again was to buy the controlling stock of the Port Company.

The business will be conducted as in the past by the Port Manufacturing Company but will be under supervision of the parent company.

The purchase definitely puts the Daven Radio Corporation set in the field.

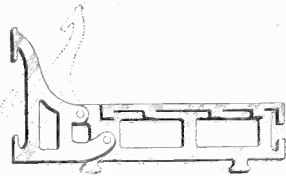
BELMUTH HANDLES SMALL PARTS

J. Belmuth, 198 Broadway, New York City, is exclusive metropolitan distributor for the well-known Fahnestock clips. In addition he handles a large line of standard radio parts. He has just taken over the Belco Cone Speaker, one of the fast-selling low priced speakers on the market. This is a single cone speaker with a strong and durable unit that will handle volume, pass all frequencies and is adapted to any set. It has just been awarded the RADIO WORLD Certificate of Merit. Besides the larger parts, Belmuth is one of the few that still handles and will continue to stock the smaller, hard to get parts and his lines include leadin and aerial wire, insulators, ground clamps, lightning arrestors and the smaller fittings which are in demand by the fan every day.

F. N. T. IN NEW POST

F. N. T. (Mr. Tracy) who has been one of the announcers at Station W. H. N., and who was associated with this popular station when it was an infant in Ridgewood, before moving to the Loew State Theatre Bldg., is now with station W. P. C. H., at present located in the Hotel Majestic. But the station will soon move to The New Park Central Hotel on 7th Ave., between 55th and 56th Sts., N. Y. C.

Bruno Markets Adjustable Brackets



BRUNO adjustable brackets.

The New Bruno adjustable brackets are now ready for immediate delivery. They are models of their kind, sturdy and handsome in appearance and will beautify any set while standing up under a heavy load. They also simplify wiring. Made of die-cast aluminum, they are light in weight and yet the tensile strength is equal to that of the hardest steel. An adjustable style is made for sets that have sloping panels or may be used right angularly. A Bruno booklet embodying the full Bruno line will be sent to all who address the Bruno Radio Corporation, 40 Paynter Avenue, Long Island City, New York.

AT YOUR SERVICE

Rate: 10 cents a word. No advertisement less than ten words.

NEW YORK Manhattan

DON'T endure poor radio reception. The right tubes, right battery voltages, correct wiring, etc., give you the utmost from your set. Let me improve your receiver if it is not up to snuff.—Max Lager, 221 Fulton St., N. Y. City.

DIAMOND OF THE AIR service. DX reception improved, if due to conditions in receiver. Also specialize on Bernard set.—T. Forshaw, 115 E. 82d Street.

Brooklyn

IF YOUR SET does not work properly we can put it in fine condition. Experts on Atwater-Kent, Ferguson, Freshman and Stromberg-Carlson. Familiar with all Radio World circuits.—Bert Reinitz, 127A Clarkson Ave., Brooklyn, N. Y.

Queens

ANY set put in fine working order. All work done at factory and set shipped in working condition. Special facilities for stopping squealing in any set.—Rider, 40 Paynter Ave., Long Island City, N. Y.

EXPERT SERVICE on Bernard, LC27, Henry-Lyford, Infradyne, Diamond of the Air, Browning-Drake, Victoreen, Lynch Lamp Socket Amplifier. Special attention to electrification of receivers and getting rid of motor-boating. Write to 122 Stuyvesant Ave., Brooklyn, N. Y., or phone Bushwick 1676.—Sidney Buchalter.

PHILADELPHIA, PA.

SINGLETRON service. Also Bernard and Diamond hookups thoroughly understood. Familiar with circuits popularized by magazines.—A. Witz, Widener Bldg.

VICTOREEN QUESTIONS ANSWERED

Any member of the trade who have questions on the 1927 Victoreen, or any equipment used in connection therewith, including audio amplifier, and B eliminator (known as the Lynch Light Socket Amplifier), and the A eliminator, should address Victoreen Editor, Radio World, 145 West 45th St., New York, N. Y.

Literature Wanted

THE names of readers of RADIO WORLD who desire literature from radio jobbers and dealers are published in RADIO WORLD on request of the reader. The blank below may be used, or a post card or letter will do instead.

RADIO WORLD,

145 West 45th St., N. Y. City.

I desire to receive radio literature

Name

Address

City or town

State

Robert T. Mawrus, 34A Rochester Ave., Brooklyn, N. Y.
Henry W. Deubs, 208 E. High St., Gorydon, Ind.
Albert Torres, 75 Elm St., Rochester, N. Y.
Milford Hardesty, Asbury College, Room 417, Morrison, Wilmore, Ky. (Dealer).
D. S. MacFarlane, 453 W. Spring St., Hazelton, Pa.
Lloyd Hust, RFD 2, Box 32, Tremont, Utah.
John Bennett, 18 Bond St., Wallington, N. J.
A. J. Welch, 808 West Mercury, Butte, Mont.
W. Roland Grover, 261 Aldrich Road, Portsmouth, New Hampshire.
Julian E. Johnson, 3522 1/2 Lombard, Everett, Wash.
J. E. Saxton, Box 155, Weosho, Mo.
William Friedman, 3303 Glenwood Road, Brooklyn, N. Y.
William Yuster, 807 2nd St., N. W., Washington, D. C.
Everett M. Renick, P. D. Box 151, Clendenin, W. Va.
U. J. Flynn, 411 Mill St., Reno, Nev.
Jack Franz, Fox Washington Theatre, Detroit, Mich.
A. Luther Kurtz, 3226 Bailey Ave., St. Louis, Mo.
Wm. D. Levin, 388 Palisade Ave., Jersey City, N. J.
F. S. Richards, 291 Plymouth, Buffalo, N. Y.
Henry R. Knight, 4439 West Papin, St. Louis, Mo.
C. E. Venard, Box C, Oil Fields, Calif.
Chas. H. Robertson, 219 Lyle Ave., East Point, Ga. (Dealer).
T. E. Patterson, 120 Pierce St. San Francisco, Calif.
Dan O'Connor, 121 Ward St., Urbana, O.
Arthur S. Uebner, 935 South 8th St., Quincy, Ill. (Dealer).
James Avenone, De Vitts Camp, Allewood, Pa.
J. M. Singleton, 3823 Morehead Ave., El Paso, Tex.
M. Lerner, 1498 Remsen Ave., Brooklyn, N. Y.
C. L. Smith, 234 East 21st St., N. Y. C.
E. J. Hendrickson, 1717 State St., East St. Louis, Ill.

NEW CORPORATIONS

Eagle A and B Eliminator Co., N. Y. City, radio \$100.00; D. Theodore, M. Blumberg, J. Kiamer, (Atty.), S. A. Fried, 291 Broadway, N. Y. City).
Radio Power Corp., N. Y. City, radio appliances, \$10.00; C. B. Babbitt, G. W. Poillon, (Atty.), S. Feur, 245 Broadway, N. Y. City).

Business Opportunities Radio and Electrical

Rates 10c per word; Minimum \$1.00; Cash with order

WE DESIGN AND BUILD special machinery, tools, dies, jigs and fixtures; experimental work; light stamping; quantity production. Reliable Machine Co., 151 West 18th St., N. Y. C.

RADIO—Available, former head largest radio concern in America, experienced in all branches, including foreign; moderate remuneration. Box 888, RADIO WORLD.

WE CONSTRUCT and design special machines, automatic dies, contract quantity stamping. Seneca Machine Co., 12 Bushwick Place, Brooklyn, N. Y.

AN ESTABLISHED WHOLESALE DISTRIBUTOR, with first-class reputation in the radio market, has recently been granted franchises for the distribution of the best-established lines; resultant expansion of business requires further capital investment of at least \$15,000, will accept experienced man in organization; thorough investigation and exchange of references invited. Box 444, Radio World.

"LIBERTY AFLAME" and other verses, by Roland Burke Hennessey. Handsomely bound in cloth; sent postpaid for \$1.00. Columbia Print, 145 West 45th Street, New York City.

(Continued from page 21)

used, if desired, instead of R3.) The greater the amplification the greater the tendency toward self-oscillation. It is indeed an advantageous point to be able to say that the set, before balancing, oscillates at high and low frequencies. The adjustable primary winding of the interstage coupler is a handy device for getting just the right stability when this condition is met, so that the set will be under the point of oscillation all the times because if there is tight coupling the oscillation at the lower waves is assured. The idea is to loosen the coupling just a tiny bit at a time, after the plate voltage and current adjustment has been made, and thus create balance. Operation just under the point of saturation or self-oscillation makes for highest efficiency and enables the reception of distant stations.

* * *

PLEASE set forth textually the wiring of the Bernard 6-tube receiver and show picture diagram of the wiring of this set. How should panel be drilled?—Edward Moyer Phillips, Stroudsburg, Pa.

The layout of the parts in the Bernard receiver is very orderly, and anybody will find it an easy matter to wire up even if a novice. Even an experienced set the physical location of the wiring. Now, let us take up some of the mounting points first. The front panel, if obtained as part of the official kit, will be completely drilled and engraved, and the bracket holes will be suitable for the new Bruno adjustable brackets. However, the picture diagram shows panel holes and other data for use in case you are trying to accommodate the set to brackets of your own manufacture, hence the 9/64-hole at upper right on the front panel is intended only as a guide to including improvised brackets. The design for home-made brackets is shown at center left in the picture diagram. Drill drum slot oblong, $1\frac{1}{4} \times 2\frac{3}{4}$ ", without rounded corners. The official panel, however, has all this drilling already done. The frame for C2 and C4 and the panel plate, which is bronzed, are mounted on the front panel by means of machine screws held by nuts in the panel rear. The plate holes are two 9/64 one of which is so marked, although both are shown. Mount switch in a 5/8 hole, which is centered $1\frac{1}{8}$ " from the bottom of the panel, in the central line. In following Fig. 470 for drilling directions, necessary only in case you are drilling your own panel, remember that the panel is shown as upside down, as it were, this representing the view of the panel when it is folded back, so that you see the rear, with the real bottom seemingly at top.

The picture diagram shows the mounting of the parts that go on the bottom of the socket strip, this view being at top of Fig. 470, while just below are set forth the parts that go on the top of the socket strip. The top view is marked "top" and the bottom view is marked "bottom." Therefore if you follow the layout as given you cannot go wrong, as the dimensions were taken from the laboratory model of the receiver.

Assuming that the panel parts are mounted, as well as the socket strip parts, first wire the filaments.

Connect all F minus posts of all six sockets with one bus. This lead runs on top of the socket strip. All A plus posts of the sockets are joined together with one bus, and this too is atop the socket shelf, although a little farther from the socket posts.

Make the following connections next:

Join the Ant. binding post to the F post of the Acme R3 transformer, GFPB, and join the F and B posts. Connect the B post to ground. G of this transformer is connected to grid of the tube through a hole drilled in the socket strip near the grid post of the socket (1).

Next tackle the coil L1L2. This has its P post connected to plate of tube 1, its B post to one side of C1, its G post to G of

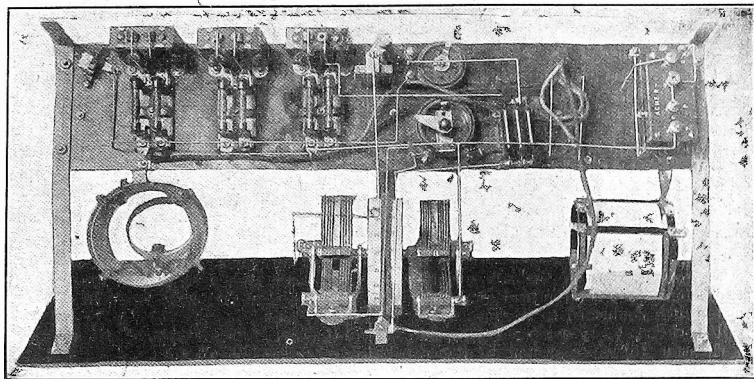


FIG. 471

View of the bottom. The fixed condensers, in the audio circuit, are at left, being, right to left, C7, C8 and C9. The first Aero coil, L1L2, is secured to the sub-panel or socket strip by twisting each of the two mounting brackets that are supplied by the coil manufacturer. Note the A plus battery lead coming direct to the Bruno light switch.

socket 2, while F is unconnected for the moment.

Going to the input into the detector tube, the coil system L3 L4 is wired with P to plate, B one side of R 1 and to one side of the fixed condenser C3. If only three posts are designated on the coils you can tell the missing one by deduction. G goes to one side of the grid condenser C5 and one side of the grid leak. With the condenser already mounted on the leak one connection takes care of both. The F post of L4 goes to F plus. The other side of the grid condenser-leak is leak soldered to the lug on the G post of the detector socket (3). The plate of detector tube is connected to C6, one of the three fixed condensers side by side on the bottom of the subpanel (Aerovox .00025 mfd. each). The other side of C6 is left unconnected for a while.

The Lynch mountings for the audio resistors next are wired.

The nearest terminal to detector plate is connected thereto, while the opposite points on the two other plate resistor clips are jointed together. Each plate lead of each of the three sockets, detector (3) first audio

(4) and second audio (5), is joined to one side of a fixed condenser of .25 mfd. capacity, all these being the Electrad 200-volt bypass of that valve. The open sides of the .25 mfd. condensers then are joined to nearest Lynch mounting clips for grid resistors and to the grid of the succeeding tube.

The single closed circuit jack is on the sub panel. The plus post (so marked on instrument) is joined to open side of the plate resistor clip for the second audio tube (5). (Continued on page 24)

Daven Bass Note Circuit Kit

COMPLETE KIT OF PARTS \$65.00
WITH FULL INSTRUCTIONS

Send 25c for Daven booklet

How to Build the Daven Bass Note Circuit

Licensed by Daven

C. W. BUTTS, INC.

42 HEDDEN PLACE EAST ORANGE, N. J.

HARD RUBBER
SHEET — ROD — TUBING
Special Hard Rubber Parts Made to Order
RADION and HARD RUBBER
PANELS, ANY SIZE
Send for Price List
WHOLESALE RETAIL
NEW YORK HARD RUBBER TURNING CO.
712 Centre Street New York



The Write Gift for Children

Individual Name Pencils
PENCIL SETS De Luxe Set: 100 post paid

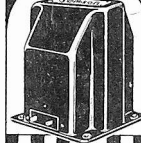
Finest genuine sheepskin leather case with coin pocket, richly embossed. Any name engraved in 18 kt. gold. Contains pencils and penholder in assorted colors, point protector, ruler, sharpener. Absolutely supreme in its class.

Send Check, Money Order or U. S. Postage.

U. S. PENCIL CO., Inc.

487 Broadway Dept. 10, New York

Samson Dual Impedance



Represents latest development for fine tone quality. Connects like transformer.

SAMSON ELEC. CO. CANTON, MASS.

VARIATIONS OF IMPEDANCES, an interesting treatise on how common impedances in the plate circuit affect signal quality and intensity, by J. E. Anderson, appeared in the November 6 issue of RADIO WORLD. 15c per copy or start your subs. with that number. RADIO WORLD. 145 W. 45th St., N. Y. C.

THE GREAT AID OF BY-PASS CONDENSERS, by John F. Rider, appeared in RADIO WORLD dated May 8. Sent on receipt of 15c, or start sub. with that number, RADIO WORLD. 145 W. 45th St., N. Y. C.

WATCH EXPIRATION DATE OF SUBSCRIPTIONS!

Subscribers will note that the end of their subscriptions is indicated on the labels on wrappers. If your wrapper shows a date earlier than the current issue, please send payment for renewal. Changes in expiration dates on wrappers appear two weeks after receipt of renewal.

RADIO WORLD, 145 West 45th St., New York City. (Phones: Bryant 0558-0559.)

THE RADIO TRADE

Freshman Ahead of 1925 by 38%

The Chas. Freshman Co. Inc. report net sales for October of \$1,482,913, an increase of 15 per cent over net sales of October 1925, which were \$1,290,174. Charles Freshman, president, further reports that the total net sales from June 1 to October 31, 1926, showed an increase of 38 per cent over the corresponding period of 1925.

In spite of this substantial increase it is pointed out by Mr. Freshman that the sales during October were greatly handicapped through the company's inability to get sufficient console cabinets to meet the demand of the trade. In order to eliminate this condition in the future the company is seriously considering the acquisition of one or more furniture factories.

Daven Becomes Set Maker, Too

W. H. Frasse, president of the Daven Radio Corporation, announced the purchase of the controlling interest of the stock of the Port Manufacturing Company, manufacturers of the Daven Bass Note Circuit. The purchase price was not divulged.

Mr. Frasse stated that the Daven Radio Corporation realized soon after granting a license to the Port Manufacturing Company that they had made a mistake. The business of the Port Company far exceeded anyone's expectations, due to the popularity of the Bass Note Set. The only way to get control of the license again was to buy the controlling stock of the Port Company.

The business will be conducted as in the past by the Port Manufacturing Company but will be under supervision of the parent company.

The purchase definitely puts the Daven Radio Corporation set in the field.

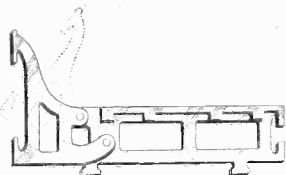
BELMUTH HANDLES SMALL PARTS

J. Belmuth, 198 Broadway, New York City, is exclusive metropolitan distributor for the well-known Fahnestock clips. In addition he handles a large line of standard radio parts. He has just taken over the Belco Cone Speaker, one of the fast-selling low priced speakers on the market. This is a single cone speaker with a strong and durable unit that will handle volume, pass all frequencies and is adapted to any set. It has just been awarded the RADIO WORLD Certificate of Merit. Besides the larger parts, Belmuth is one of the few that still handles and will continue to stock the smaller, hard to get parts and his lines include leadin and aerial wire, insulators, ground clamps, lightning arrestors and the smaller fittings which are in demand by the fan every day.

F. N. T. IN NEW POST

F. N. T. (Mr. Tracy) who has been one of the announcers at Station W. H. N., and who was associated with this popular station when it was an infant in Ridgewood, before moving to the Loew State Theatre Bldg., is now with station W. P. C. H., at present located in the Hotel Majestic. But the station will soon move to The New Park Central Hotel on 7th Ave., between 55th and 56th Sts., N. Y. C.

Bruno Markets Adjustable Brackets



BRUNO adjustable brackets.

The New Bruno adjustable brackets are now ready for immediate delivery. They are models of their kind, sturdy and handsome in appearance and will beautify any set while standing up under a heavy load. They also simplify wiring. Made of die-cast aluminum, they are light in weight and yet the tensile strength is equal to that of the hardest steel. An adjustable style is made for sets that have sloping panels or may be used right angularly. A Bruno booklet embodying the full Bruno line will be sent to all who address the Bruno Radio Corporation, 40 Paynter Avenue, Long Island City, New York.

AT YOUR SERVICE

Rate: 10 cents a word. No advertisement less than ten words.

NEW YORK Manhattan

DONT endure poor radio reception. The right tubes, right battery voltages, correct wiring, etc., give you the utmost from your set. Let me improve your receiver if it is not up to snuff.—Max Lager, 221 Fulton St., N. Y. City.

DIAMOND OF THE AIR service. DX reception improved, if due to conditions in receiver. Also specialize on Bernard set.—T. Forshaw, 115 E. 82d Street.

Brooklyn

IF YOUR SET does not work properly we can put it in fine condition. Experts on Atwater-Kent, Ferguson, Freshman and Stromberg-Carlson. Familiar with all Radio World circuits.—Bert Reinitz, 127A Clarkson Ave., Brooklyn, N. Y.

Queens

ANY set put in fine working order. All work done at factory and set shipped in working condition. Special facilities for stopping squealing in any set.—Rider, 40 Paynter Ave., Long Island City, N. Y.

EXPERT SERVICE on Bernard, LC27, Henry-Lyford, Infradyne, Diamond of the Air, Browning-Drake, Victoreen, Lynch Lamp Socket Amplifier. Special attention to electrification of receivers and getting rid of motor-boating. Write to 122 Stuyvesant Ave., Brooklyn, N. Y., or phone Bushwick 1676.—Sidney Buchalter.

PHILADELPHIA, PA.

SINGLETROL service. Also Bernard and Diamond hookups thoroughly understood. Familiar with circuits popularized by magazines.—A. Witz, Widener Bldg.

VICTOREEN QUESTIONS ANSWERED

Any member of the trade who has questions on the 1927 Victoreen, or any equipment used in connection therewith, including audio amplifier, and B eliminator (known as the Lynch Light Socket Amplifier), and the A eliminator, should address Victoreen Editor, Radio World, 145 West 45th St., New York, N. Y.

Literature Wanted

THE names of readers of RADIO WORLD who desire literature from radio jobbers and dealers are published in RADIO WORLD on request of the reader. The blank below may be used, or a post card or letter will do instead.

RADIO WORLD,

145 West 45th St., N. Y. City.

I desire to receive radio literature

Name

Address

City or town

State

Robert T. Mawrus, 34A Rochester Ave., Brooklyn, N. Y.
Henry W. Deubs, 208 E. High St., Gorydon, Ind.
Albert Torres, 75 Elm St., Rochester, N. Y.
Milford Hardesty, Asbury College, Room 417, Morrison, Wilmore, Ky. (Dealer).
D. S. MacFarlane, 453 W. Spring St., Hazelton, Pa.
Lloyd Hust, RFD 2, Box 32, Tremont, Utah.
John Bennett, 18 Bond St., Wallington, N. J.
A. J. Welch, 808 West Mercury, Butte, Mont.
W. Roland Grover, 261 Aldrich Road, Portsmouth, New Hampshire.
Julian E. Johnson, 3522½ Lombard, Everett, Wash.
J. E. Saxton, Box 155, Weosho, Mo.
William Friedman, 3303 Glenwood Road, Brooklyn, N. Y.
William Yuster, 807-2nd St., N. W., Washington, D. C.
Everett M. Renick, P. D. Box 151, Clendenin, W. Va.
U. J. Flynn, 411 Mill St., Reno, Nev.
Jack Franz, Fox Washington Theatre, Detroit, Mich.
A. Luther Kurtz, 3226 Bailey Ave., St. Louis, Mo.
Wm. D. Levin, 388 Palisade Ave., Jersey City, N. J.
F. S. Richards, 291 Plymouth, Buffalo, N. Y.
Henry R. Knight, 4439 West Papin, St. Louis, Mo.
C. E. Venard, Box C, Oil Fields, Calif.
Chas. H. Robertson, 219 Lyle Ave., East Point, Ga. (Dealer).
T. E. Patterson, 120 Pierce St. San Francisco, Calif.
Dan O'Connor, 121 Ward St., Urbana, O.
Arthur S. Uebner, 935 South 8th St., Quincy, Ill. (Dealer).
James Avenone, De Vitts Camp, Allewood, Pa.
J. M. Singleton, 3823 Morehead Ave., El Paso, Tex.
M. Lerner, 1498 Remsen Ave., Brooklyn, N. Y.
C. L. Smith, 234 East 21st St., N. Y. C.
E. J. Hendrickson, 1717 State St., East St. Louis, Ill.

NEW CORPORATIONS

Eagle A and B Eliminator Co., N. Y. City, radio \$100,000; D. Theodore, M. Blumberg, J. Kramer. (Atty., S. A. Fried, 291 Broadway, N. Y. City).
Radio Power Corp., N. Y. City, radio appliances, \$10,000; C. B. Babbitt, G. W. Poillon. (Atty., S. Feur, 245 Broadway, N. Y. City).

Business Opportunities Radio and Electrical

Rates 10c per word; Minimum \$1.00; Cash with order

WE DESIGN AND BUILD special machinery, tools, dies, jigs and fixtures; experimental work; light stamping; quantity production. Reliable Machine Co., 151 West 18th St., N. Y. C.

RADIO—Available, former head largest radio concern in America, experienced in all branches, including foreign; moderate remuneration. Box 888, RADIO WORLD.

WE CONSTRUCT and design special machines, automatic dies, contract quantity stamping. Seneca Machine Co., 12 Bushwick Place, Brooklyn, N. Y.

AN ESTABLISHED WHOLESALE DISTRIBUTOR, with first-class reputation in the radio market, has recently been granted franchises for the distribution of the best-established lines; resultant expansion of business requires further capital investment of at least \$15,000, will accept experienced man in organization; thorough investigation and exchange of references invited. Box 444, Radio World.

"LIBERTY AFLAME" and other verses, by Roland Burke Hennessy. Handsomely bound in cloth; sent postpaid for \$1.00. Columbia Print, 145 West 45th Street, New York City.

(Continued from page 21)

used, if desired, instead of R3.) The greater the amplification the greater the tendency toward self-oscillation. It is indeed an advantageous point to be able to say that the set, before balancing, oscillates at high and low frequencies. The adjustable primary winding of the interstage coupler is a handy device for getting just the right stability when this condition is met, so that the set will be under the point of oscillation all the times because if there is tight coupling the oscillation at the lower waves is assured. The idea is to loosen the coupling just a tiny bit at a time, after the plate voltage and current adjustment has been made, and thus create balance. Operation just under the point of saturation or self-oscillation makes for highest efficiency and enables the reception of distant stations.

* * *

PLEASE set forth textually the wiring of the Bernard 6-tube receiver and show picture diagram of the wiring of this set. How should panel be drilled?—Edward Moyer Phillips, Stroudsburg, Pa.

The layout of the parts in the Bernard receiver is very orderly, and anybody will find it an easy matter to wire up even if a novice. Even an experienced set the physical location of the wiring. Now, let us take up some of the mounting points first. The front panel, if obtained as part of the official kit, will be completely drilled and engraved, and the bracket holes will be suitable for the new Bruno adjustable brackets. However, the picture diagram shows panel holes and other data for use in case you are trying to accommodate the set to brackets of your own manufacture, hence the 9/64-hole at upper right on the front panel is intended only as a guide to including improvised brackets. The design for home-made brackets is shown at center left in the picture diagram. Drill drum slot oblong, $1\frac{1}{4} \times 2\frac{3}{4}$ ", without rounded corners. The official panel, however, has all this drilling already done. The frame for C2 and C4 and the panel plate, which is bronzed, are mounted on the front panel by means of machine screws held by nuts in the panel rear. The plate holes are two 9/64 one of which is so marked, although both are shown. Mount switch in a 5/8 hole, which is centered $1\frac{1}{8}$ " from the bottom of the panel, in the central line. In following Fig. 470 for drilling directions, necessary only in case you are drilling your own panel, remember that the panel is shown as upside down, as it were, this representing the view of the panel when it is folded back, so that you see the rear, with the real bottom seemingly at top.

The picture diagram shows the mounting of the parts that go on the bottom of the socket strip, this view being at top of Fig. 470, while just below are set forth the parts that go on the top of the socket strip. The top view is marked "top" and the bottom view is marked "bottom." Therefore if you follow the layout as given you cannot go wrong, as the dimensions were taken from the laboratory model of the receiver.

Assuming that the panel parts are mounted, as well as the socket strip parts, first wire the filaments.

Connect all F minus posts of all six sockets with one bus. This lead runs on top of the socket strip. All A plus posts of the sockets are joined together with one bus, and this too is atop the socket shelf, although a little farther from the socket posts.

Make the following connections next: Join the Ant. binding post to the F post of the Acme R3 transformer, GFB, and join the F and B posts. Connect the B post to ground. G of this transformer is connected to grid of the tube through a hole drilled in the socket strip near the grid post of the socket (1).

Next tackle the coil L1L2. This has its P post connected to plate of tube 1, its B post to one side of C1, its G post to G of

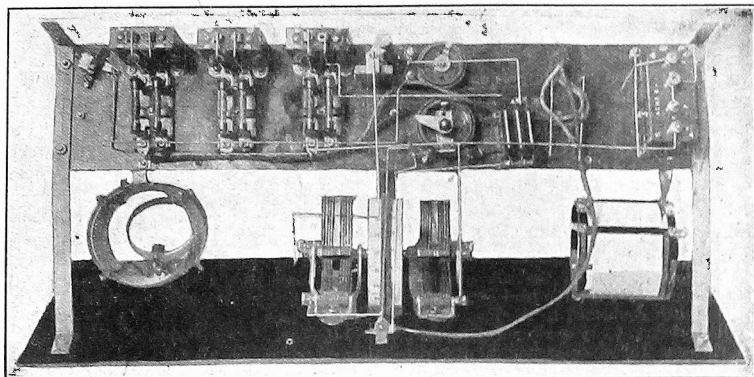


FIG. 471

View of the bottom. The fixed condensers, in the audio circuit, are at left, being, right to left, C7, C8 and C9. The first Aero coil, L1L2, is secured to the sub-panel or socket strip by twisting each of the two mounting brackets that are supplied by the coil manufacturer. Note the A plus battery lead coming direct to the Bruno light switch.

socket 2, while F is unconnected for the moment.

Going to the input into the detector tube, the coil system L3 L4 is wired with P to plate, B one side of R 1 and to one side of the fixed condenser C3. If only three posts are designated on the coils you can tell the missing one by deduction. G goes to one side of the grid condenser C5 and one side of the grid leak. With the condenser already mounted on the leak one connection takes care of both. The F post of L4 goes to F plus. The other side of the grid condenser-leak is leak soldered to the lug on the G post of the detector socket (3). The plate of detector tube is connected to C6, one of the three fixed condensers side by side on the bottom of the subpanel (Aerovox .00025 mfd. each). The other side of C6 is left unconnected for a while.

The Lynch mountings for the audio resistors next are wired.

The nearest terminal to detector plate is connected thereto, while the opposite points on the two other plate resistor clips are joined together. Each plate lead of each of the three sockets, detector (3) first audio

(4) and second audio (5), is joined to one side of a fixed condenser of .25 mfd. capacity, all these being the Electrad 200-volt bypass of that valve. The open sides of the .25 mfd. condensers then are joined to nearest Lynch mounting clips for grid resistors and to the grid of the succeeding tube.

The single closed circuit jack is on the sub panel. The plus post (so marked on instrument) is joined to open side of the plate resistor clip for the second audio tube (5).

(Continued on page 24)

Daven Bass Note Circuit Kit
COMPLETE KIT OF PARTS \$65.00
WITH FULL INSTRUCTIONS
Send 25c for Daven booklet
How to Build the Daven Bass Note Circuit
Licensed by Daven
C. W. BUTTS, INC.
42 HEDDEN PLACE EAST ORANGE, N. J.

HARD RUBBER
SHEET — ROD — TUBING
Special Hard Rubber Parts Made to Order
RADION AND HARD RUBBER
PANELS, ANY SIZE
Send for Price List
WHOLESALE RETAIL
NEW YORK HARD RUBBER TURNING CO.
212 Centre Street New York



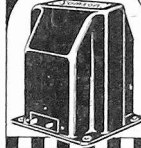
The Write Gift
for Children

Individual Names
PENCIL SETS 100 post paid
De Luxe Set: 1 post paid

Finest genuine sheepskin leather case with coin pocket, richly embossed. Any name engraved in 18 kt. gold. Contains pencils and penholder in assorted colors, point protector, ruler, sharpener. Absolutely supreme in its class.

Send Check, Money Order or U. S. Postage.
U. S. PENCIL CO., Inc.
487 Broadway Dept. 1C, New York

Samson Dual Impedance



Represents latest development for fine tone quality. Connects like transformer.

SAMSON ELEC. CO. CANTON, MASS.

VARIATIONS OF IMPEDANCES, an interesting treatise on how common impedances in the plate circuit affect signal quality and intensity, by J. E. Anderson, appeared in the November 6 issue of **RADIO WORLD**. 15c per copy or start your subs. with that number. **RADIO WORLD**, 145 W. 45th St., N. Y. C.

THE GREAT AID OF BY-PASS CONDENSERS, by John F. Rider, appeared in **RADIO WORLD** dated May 8. Sent on receipt of 15c, or start sub. with that number, **RADIO WORLD**, 145 W. 45th St., N. Y. C.

WATCH EXPIRATION DATE OF SUBSCRIPTIONS!

Subscribers will note that the end of their subscriptions is indicated on the labels on wrappers. If your wrapper shows a date earlier than the current issue, please send payment for renewal. Changes in expiration dates on wrappers appear two weeks after receipt of renewal.

RADIO WORLD, 145 West 45th St., New York City. (Phones: Bryant 0558-0559.)

UNIVERSITY

(Continued from page 23)

and the corresponding clip of the previous tube (4), and this lead is carried to the movable arm of the Electrad Royalty type F and to the open side of C3, one of the three fixed condensers. If you can not easily distinguish the movable arm from the stationary post of the Royalty, R1, connect either way.

Now carry the closed sides of the grid resistor clips intended for service in the grids of tubes 5 and 4 to ground.

The front panel and the sub panel now may be joined and the top lead of the Bruno lig ht switch connected to the plus bus wire of all sockets, at any one point. One side of the rheostat R9 is connected to the upper bottom switch point and the other side of R9 goes to the F minus lead of the six Air Gap sockets. The free switch point goes to F plus.

Connect the variable condensers. The rotor of C2 goes to grid of tube 2 and stator to ground. The rotor of C4 goes to grid condenser C5 and stator goes to F plus (any socket.) For Bruno condensers rotor to grid is correct.

Welly's
CHICAGO

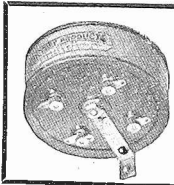
COMPLETELY WIRED
TUNED RADIO FREQUENCY
COMBINATION CHASSIS
(Ready to Mount on Panel)

Send (postal card will do) for complete data and Special Radio Catalogue.

WILLIAM A. WELTY & CO.

Radio Manufacturers

36 S. STATE ST. CHICAGO, ILL.



VICTOREEN
Super Coils

Send for Folder

Geo. W. Walker Co.
6522 Carnegie Ave.
Dept. B Cleveland, O.

Bernard Blueprint
PANEL, SUBPANEL
AND THE WIRING \$1.00
Price includes constructional article by Herman Bernard and a nameplate for front panel.
RADIO WORLD
145 West 45th St. New York City

The open ends of C1 and C6 go to A minus.

Connect the cable leads. Red may be used for A plus and be connected to switch, the corresponding switch contact to the F plus bus of the sockets. The A minus, black, goes to the rheostat at post other than the one connected directly to F minus of tubes. B plus det. is soldered to the open terminal of the detector plate mount, while B plus amp. goes to the Electrad Royalty terminal other than the one connected to coils. CC minus is the le ad to the last grid leak. R8, while C minus is the ground lead, connected by cable to any convenient point.

The top should be put on the cable leads at the forked terminals reserved for battery connections.

Connect the coil side of C1 to the corresponding side of C3.

* * *

IS IT POSSIBLE to use a power tube as a radio frequency amplifier? If not, why not?—Joseph Gort, Pittsburgh, Pa.

When you use a power tube as a radio frequency amplifier the volume is increased considerably but the selectivity declines somewhat. The very fact of increased amplification without additional tuning causes the diminished selectivity. As the general idea imparted by the word "selectivity" is the ability of a receiver to discriminate between the resonant frequency and all other frequencies, the discrimination is rendered more difficult when the power or energy supplied to the first tuned circuit is increased.

Power tubes as radio amplifiers are very satisfactory and their use has been retarded somewhat by the fact that so many power tubes are labelled "last audio stage." This warning leads some fans to fear, perhaps, that if the tube is placed in any other socket, the set may blow up!

As there is no such thing as a receiver that is universally suitable for all locations, without possibility of improvement by any adjustment, a radio receiver is rendered doubly attractive because of

the factors of adjustment and option which make it possible to accommodate it to the needs of any location in a simple and quick manner.

Whether your location will justify the use of a power tube in the first socket can be determined very quickly and without expense. It is assumed that a power tube is used in the final audio stage and that it is of the 5-volt 0.5 ampere type. Simply transpose this power tube and the A type tube that is in the first socket. In the run of sets this can be done without rheostat adjustment. In other receivers suitable transposition of ballast resistors may have to be made. Also it may be advisable slightly to alter the grid bias on the last audio tube. Your ear will tell you right away the effect of the power tube as a radio amplifier, in that volume will increase considerably. Then you may test for selectivity by finding out whether you are able to separate stations satisfactorily. In congested areas, like the Metropolitan District, this is not always the happy result, but in almost any locations say 50 miles outside of such cities as New York, Chicago and Philadelphia (toward the south), great gain will be accomplished by using a power tube thus, and still all necessary selectivity will be preserved. This decided, get another power tube for the final AF socket.

If the selectivity necessary for satisfactory receiver operation in your location is represented as S, then you may use a power tube, which of itself gives you less than S, but by decreasing the coupling between circuits you will get back to S again. When the set is made very selective, while the volume is less than under the other condition (of normal selectivity) it is still quite adequate, only you have to tune more carefully, so as not to pass the resonance point. Under one condition a station that will come in at a setting, say, of 50 on the right-hand drum, and still give audibility over from three to five divisions of the scale, will pass out of audibility in one or two divisions or less, under the ultra-selective system.

* * *

CAN a set like the Bernard be worked successfully on a trickle charger combination?—Percy Van Roos, Oakland, Cal.

The use of a 6-volt storage battery, with trickle charger, is very satisfactory in connection with the Bernard receiver. Under these conditions the storage battery need not be one of high rating in ampere hours. With the periodic charging system formerly so popular, a receiver like this, which, if a power tube is used in the first RF stage, and the other tubes as specified, draws 2 amperes, nothing less than a 120-ampere-hour storage A battery would be

LOOK UP DOWN
SUPERHETERODYNE SPECIALIST
Complete parts for Infra-dyne—Fenway Four, etc.
Handsome Leatherette Log and Data Book
FREE Send Ten Cents to Cover Mailing Cost
CHAS. W. DOWN, M. E.
2030 Broadway N. Y. C. Phone Trafalgar 1974

FREE RADIO CATALOG

NEW 1927 Write Today to
Chicago Salvage Stock Store
509 S. State St., Dept. R.W., CHICAGO, U.S.A.

MORE THAN a score of new kits—all the latest and best—with specified parts to build them—at prices that mean big savings for you. And all the latest parts and accessories as advertised in current radio magazines. The largest, most complete and up-to-date radio stock in the world. Yours to choose from in this new catalog. Write for your



new and improved
FRESHMAN MASTERPIECE

AT AUTHORIZED
FRESHMAN DEALERS ONLY

\$

**HOW TO MAKE MONEY
AS SERVICE EXPERT**

Write for Free Particulars

M. LERNER

145 West 45th St.

New York City

Bring in
Every
Station
on the
Air
With a

WAVE-X
Condensing
ANTENNA

An aerial that can be erected on wall, chimney or roof, anywhere 5 foot square is available. Provides sharper tuning, increased selectivity and is non-directional. Twelve highly conductive feeders reaching out in all directions have the capacity of long single wire. Perfect insulation prevents losses. Erected and dismantled quickly. A single upright to erect, hammer and screwdriver the only tools needed. No. 2, 5 foot pole ready to install, full instructions, \$12.50. Get a Wave-X now.

REDI-MAST
FOR AERIALS

A strong hand turned rock maple pole 5 or 8 foot lengths. Fits any roof. Will carry heaviest sleet covered single or multiple wire antennas in strong wind. Complete, guy rods, nut irons, roof sockets, anchor pins and full instructions. 5 foot mast \$3.50 each, 8 foot \$4.25. Ask your dealer. Dealers—Wave-X and Redi-Mast are quick sellers. Write today for our dealer offer.

THE ZINKE CO.
1323 S. Michigan Ave., Chicago
THE PRESSED METAL MFG. CO.
Waukesha, Wis.

convenient. Otherwise recharging would have to be done too often.

But the trickle charger does away with the necessity of large capacity of the battery, because the trickle charging goes on (at a very, very slow rate) all the while the set is not in use, and does not take place while the receiver is being operated. Hence no wide range of drain is necessary.

If the longest stretch during which you use the set is 5 hours on end, then you would consume 10 amperes. Allowing a 50 per cent. safety margin, the A battery would not have to be more than 15 ampere hours capacity. In practice, however, even the small storage batteries that are sold specially for use in conjunction with trickles have a higher capacity than that. But any storage battery will do, particularly if you have one now. There is no necessity for a small one. The reason for using a small one is simply that there is no necessity for a large one.

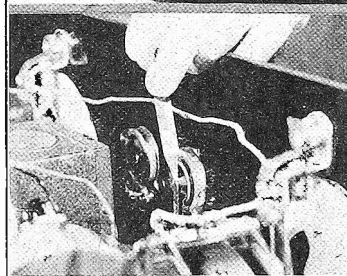
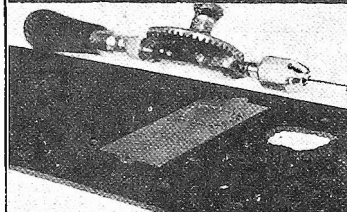
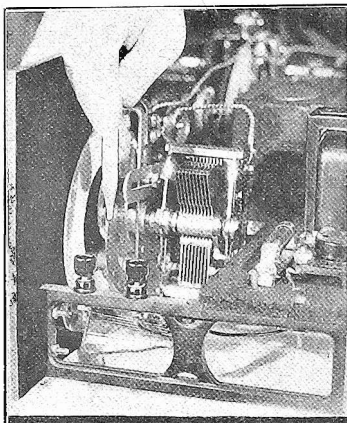
The receiver uses only one rheostat, and that simply reduces the battery voltage of 6 to that voltage required for heating the filaments of the tubes at the combined point of maximum efficiency and stability (5 volts). Hence we desire to drop one volt. The resistance necessary to do this is easily determined by Ohm's law. Assuming that two power tubes (each .5 ampere filament drain) and four other tubes (each .25 ampere drain) are used, the voltage being the same for all, we simply solve for

$$R = \frac{E}{I}$$

where R is the resistance in ohms, E is the voltage in volts and I is the current in amperes. We know the amperage is .5+.5+.25+.25+.25+.25 or 2 and that the voltage is 1 (the amount we desire to drop, or the difference between 6 and 5). Hence the required resistance is .5 ohm. But we allow a safety margin by employing a 2-ohm rheostat and adjusting it until the resistance in the circuit is .5 ohm, or, if we have a voltmeter handy, until the voltage between the low side of the rheostat and the A battery plus reads 5.

The only precaution needed is that the rheostat shall have a resistance substance that will pass 2 amperes at 5 volts. Most wire wound rheostats will pass only 1.5 amperes and anything more will cause them to heat up. If larger wire is used on the wire wound type (as in the case of the Electrad rheostat in the Bernard circuit), then the full 2 amperes will be safely carried without heating, indeed a respectable margin is left besides. Thus the rheostat is of the power type.

Of course the receiver will work with 99



FIGS. 472, 473, 474

How the Mar-co dials are put on the Hi-Power. Pencil points to the switch rheostat.

type tubes, but in that case a 20-ohm rheostat is recommended, if the source is 4½ volts, while if 99 tubes are to be used

from a 6-volt source a 30-ohm rheostat, or larger, should be used.

I READ with interest the description of the 4-Tube Hi-Power by Herbert E. Hayden in the Nov. 13 issue of Radio World, and would like to ask a few questions, before I start construction. (1)—How is the baseboard cut? (2)—Can the bell wire be used for wiring? (3)—Are binding posts used for battery and antenna-ground connections? (4)—How are the sockets placed? (5)—I have two 20 ohm Electrad rheostats. Can they be used? (6)—How thick should the baseboard be?—Harvey Williams, Atlanta, Georgia.

(1, 3 and 4)—Figs. 472, 473, 474, 475, 476 and 477 illustrate these points. Binding posts are used. Note the positions of the coils and transformers. (2)—Yes.

(Concluded on page 26)

S. HAMMER RADIO CO.

303 Atkins Avenue, Brooklyn, N. Y.

Please send me FREE Your NEW

RADIO CATALOG

Name
Address
City State
FILL OUT AND MAIL

Why is the Karas Equamatic the Most Efficient Receiver Ever Designed?

Write us for Full Information

KARAS ELECTRIC CO.

1148 Association Bldg., Chicago, Ill.

Protect Your Set
BIRNBACH BATTERY CABLE
SIMPLIFIES THE CONNECTING OF
RADIO BATTERIES
SEPARATE COLORED WIRES
5 Conductor Cable with Soldered Terminals 50¢
ALSO MADE IN 6-7-8 WIRE CABLES

Improve Your Reception
BY PLACING YOUR LOUD SPEAKER ANY
DISTANCE FROM YOUR RECEIVER
20 ft. Extension Cord with Connector 1.00
AND 30-40-50-100-FOOT UNITS
SEND FOR FREE LITERATURE
BIRNBACH RADIO CO.
370-SEVENTH AVE., NEW YORK CITY

MAKE YOUR OWN THREE FOOT CONE SPEAKER IN LESS THAN AN HOUR WORLD'S FINEST LOUD SPEAKER ~ GENUINE ~ "ENSCO" 3" CONE KIT

ONLY
\$10
Can be assembled
in Less Than an
- HOUR -



ONLY
\$10
The Original Three Foot
Cone Speaker
- KIT -

NO DISTORTION **THE SOLUTION OF THE LOUD-SPEAKER PROBLEM** **PERFECT FIDELITY**
No Choice of Leading Engineers

COMPLETE parts furnished in kit form.

We guarantee this speaker the equal of any manufactured cone speaker at any price. With this THREE-FOOT CONE SPEAKER you hear all the tones. It brings out the true depth and beauty of orchestral and instrumental music. Can be operated softly for living room music or full volume for dancing, and without trace of distortion. Kit includes famous "ENSCO" cone unit,

the only direct-drive, distortionless unit for large cones; Alhambra Fonotex for big cone, with brass apex, two sepia prints showing cabinet or simple stand construction. All necessary instructions.

Buy this wonderful speaker under our absolute guarantee. Your money back if you are not convinced that it is the finest reproducing medium obtainable at any price. It works on any set, with ordinary Tubes or with Power Output.

**SEND
NO
MONEY!**

Write your name plainly as indicated below, then mail and complete kit will be forwarded to you. Just pay postman \$10.00 upon delivery.

Name
Address
City and State
ENGINEERS SERVICE CO., 25 Church Street (Desk W), New York City



UX POWER TUBES installed in any set without rewiring by Na-Ald Adapters and Connectorals. For full information write Na-Ald Manufacturing Co., Dept. S-20, Springfield, Mass.



"Midget" Rheostat with Filament Switch

A rheostat and filament switch in one; eliminates one part and simplifies operation. Made in all resistances.

Cartor parts are specified for the most popular circuits.

Any dealer can supply

In Canada—

Cartor Radio Co., Limited, Toronto

Cartor Radio Co.
300 E. MADISON AVENUE
CHICAGO, ILL. U.S.A.

UNIVERSITY

(Concluded from page 25)

(5)—Yes, for controlling the detector and RF filaments. (6)— $\frac{1}{2}$ ".

CAN I build the 5-tube Neutrodyne, shown on page 11 of the June 26 issue of Radio World, cutting the neutralization out of the circuit, so that the set resembles a standard 5-tube tuned RF set only? I have three coils of the basket weave type, containing 10 turn primaries and 62 turn secondaries. The form is $2\frac{1}{2}$ " in diameter and No. 24 DDC wire is used. Can they be used? I intend to follow the rest of the wiring diagram. I don't wish to use the neutralization, because it will require tampering with the coils.—Henry Morris, Denver, Colo.

Yes, you can wire the set using these coils. However, it must be remembered that the control will be a bit more critical.

Radio Mailing Lists

27428—Radio Dealers, Retail, Per M.	\$7.50
2660—Radio Mfrs., Per List.	20.00
2857—Radio Jobbers, Per List.	22.50
1847—Radio Jobbers rated \$5,000 and up, Per List	15.00
1060—Radio Mfrs. Complete Sets, Per List	10.00

and any other Radio List you want. Ask for detailed price lists all guaranteed 98% correct.

Trade Circular Co., Inc.

166 W. Adams Street

Chicago

Samson Dual Impedance

Gives wonderful tone quality at low cost. Connects like transformer.



Samson Elec. Co. CANTON, MASS.

M & H

ESTABLISHED 30 YEARS
RADIO'S LARGEST KIT
SUPPLY HOUSE

Headquarters for Radio Kits

Victoreen
Karas Equamatic
Browning-Drake
Bernard Six

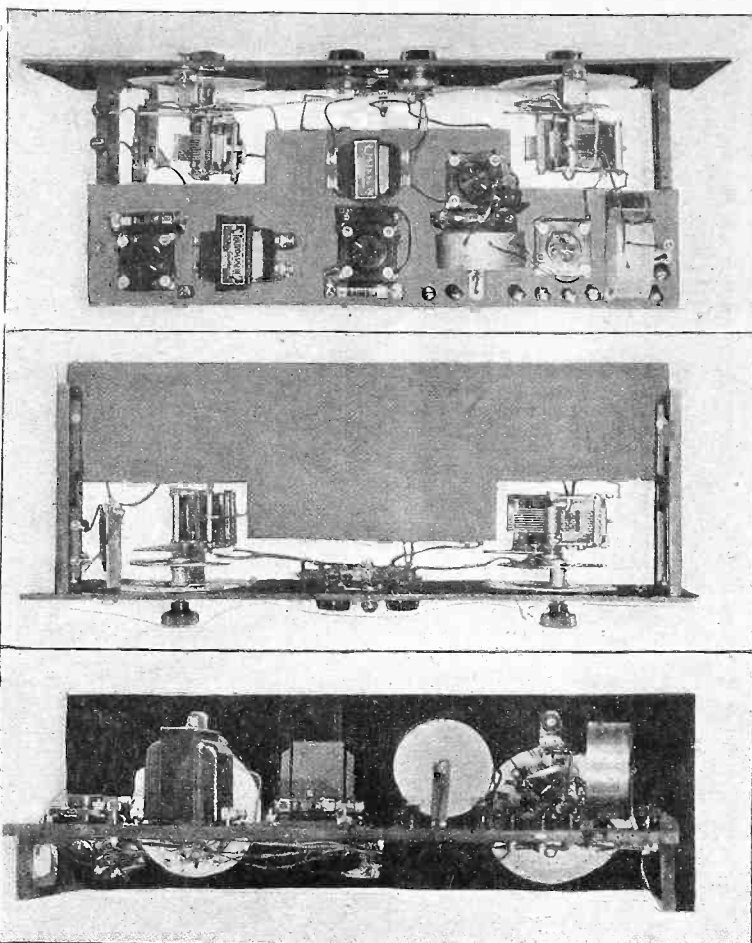
Tell us what you want—we will do the rest. Oldest mail order house specializing in Kits.

Our Catalog Will be ready soon.

It will pay Set Builders to send for it.

M.&H. SPORTING GOODS CO

512 Market St., Philadelphia



FIGS. 475, 476, 477 (top to bottom)

The top, bottom and side views of the Hayden Hi-Power receiver. Sickles coils are used.

ELECTRAD PARTS

Specified in the

Bernard Circuit

- 1 Electrad Royalty Variable Resistance—Type F.
- 3 Electrad By-Pass Condensers—200-Volt Class.
- 1 Two-ohm Electrad Rheostat.
- 1 Electrad Single-Circuit Closed Jack.
- 1 Electrad Lamp Socket Antenna.

THE 1927 MODEL VICTOREEN has been covered in the following issues of RADIO WORLD: Sept. 11, 18, 25, Oct. 2 and 9. Any copy sent on receipt of 15c, or 5 issues for 75c. RADIO WORLD, 145 W 45th St., N. Y. C.

RADIO CATALOG AND HOOK-UPS FREE

Our great new 1927 catalog, fresh from the press, contains the very newest in complete sets, parts and accessories—hundreds of amazing bargains. 250,000 customers testify to our wonderful values and reliability. Complete information, 161 pages on the newest circuits and most practical popular sets FREE. SEND QUICK for your copy. (Please include name of friend who is interested in Radio.)

THE BARAWIK CO., 560 Monroe Street, CHICAGO

THE ONLY AUTHORIZED

Bernard SERVICE STATION

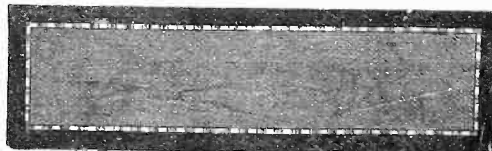
Questions Answered, Wiring Problems Solved, COMPLETE KITS as specified by HERMAN BERNARD

JAYNIXON LABORATORIES
57 DEY STREET NEW YORK CITY

LIGNOLE

After thoroughly canvassing the field for a front panel that combined the highest electrical efficiency with beauty unsurpassed, Herman Bernard selected inlaid walnut Lignole for the Bernard set. The most discriminating radio engineers and designers regularly choose Lignole, the NEW specially treated wood that meets all panel requirements.

Chosen by *Bernard*
for His 6-Tube Set

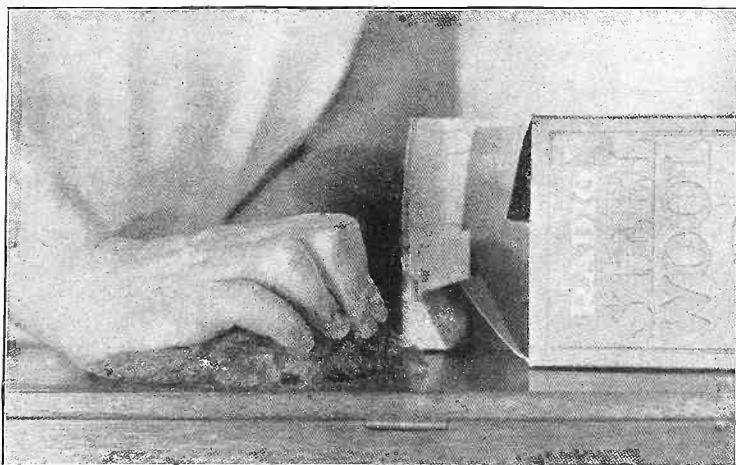


LIGNOLE CORPORATION OF AMERICA

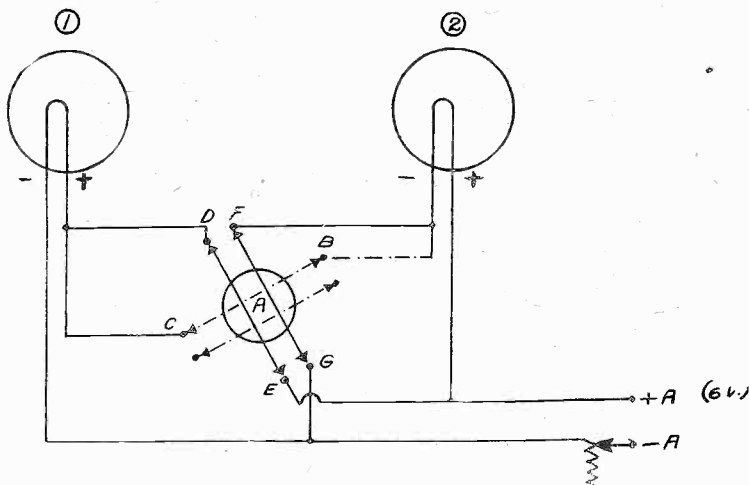
508 SOUTH DEARBORN STREET

CHICAGO, ILL.

STEEL WOOL SMOOTHS WOOD



RUBBING lightly with steel wool, in the manner shown, removes cabinet imperfections, if the rubbing is followed up by a light oil polish. Use the very finest grade of steel wool.



SO THAT the advantages of the —99 or the —01A type tubes in various circuits may be determined without rewiring the set, the scheme diagrammed above, using a series-parallel switch may be used. When using the —99's, the switch is turned for a series connection and when using the —01A's, turn the switch for parallel connection.

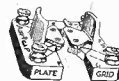
DOROTHY GOLDSMITH JOINS WRNY FEATURE LIST

Dorothy Goldsmith, a soprano with a voice of rare charm and color, will broadcast hereafter from WRNY, N. Y. City, as part of that station's Monday morning programs. She makes her initial appearance next Monday in a program of light selections. A pupil of de Reszke, Segal, Mme. Sandish, Garrique-Mott and other noted European teachers, Mrs. Goldsmith has made a name for herself on the concert and operatic stages. She has sung with the Metropolitan Opera Company.

Make any Good Receiver BETTER

CEC TUBES

C.E. MFG. CO.
Providence
R.I.



The AIRGAP SOCKET
"It gets that last mile"

Selected by Herman Bernard for Bernard Six on account of the gap which assures lowest capacity, prevents feedback and gives maximum output.

At Dealers, or direct postpaid 60c
AIRGAP PRODUCTS CO.
10 Campbell St. Newark, N. J.

LYNCH METALLIZED

WARRANTED FIXED RESISTORS

THE vital importance of a silent, accurate resistor cannot be over-estimated. Comprising a concentrated metallized deposit one-thousandth of an inch thick, upon a glass core and sealed forever within the tube, each Lynch Resistor is warranted absolutely noiseless, permanently accurate, dependable! Guaranteed accuracy—10% in production they average 5%. .25; .5; 1; 2; 3; 4; 5; 6; 7; 8; 9; 10 Meg., 50c. .025; .09; .1 Meg., 75c. Single mounting 35c; Double, 50c. If your dealer cannot supply you, send stamps, check or money order. We ship postpaid same day order is received.

Dealers—Get on our mailing list; we keep you posted on new developments. Write us today! 426-W

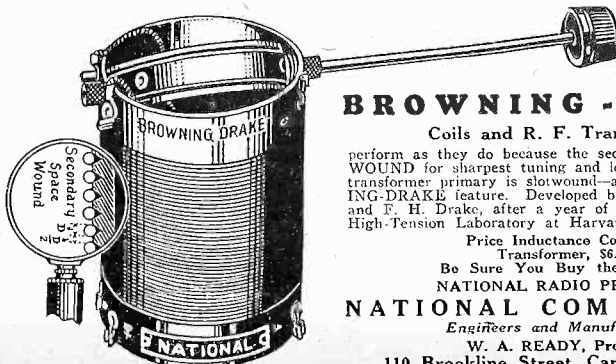
ARTHUR H. LYNCH, INC. **MEMBER RMA** 250 W. 57th St. New York, N.Y.

TOBE

One object only,
to make and sell
only the best Con-
densers and other
Technical Apparatus

Tobe Deutschmann Co.
Engineers and Manufacturers of
Technical Products
Cambridge, Mass.

NATIONAL



BROWNING-DRAKE

Coils and R. F. Transformers

perform as they do because the secondaries are SPACE-WOUND for sharpest tuning and lowest resistance. The transformer primary is slotwound—an exclusive BROWNING-DRAKE feature. Developed by Glenn H. Browning and F. H. Drake, after a year of research at the Cruik High-Tension Laboratory at Harvard University.

Price Inductance Coil, \$2.00

Transformer, \$6.50

Be Sure You Buy the Genuine

NATIONAL RADIO PRODUCTS

NATIONAL COMPANY, Inc.

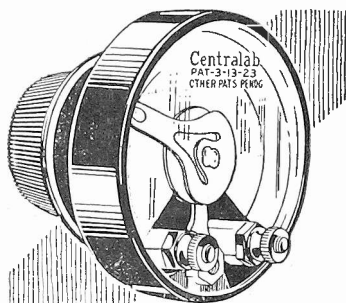
Engineers and Manufacturers

W. A. READY, President

110 Brookline Street, Cambridge, Mass.

Harkness Promoted

William E. Harkness, vice-president and general manager of the Broadcasting Company of America, resigned that position when this company was taken over by the National Broadcasting Company (Incorporated), the new owners of WEAf, to become manager of Auxiliary Services of the American Telephone and Telegraph Company. On the afternoon before his departure the "WEAF'ers," one hundred and fifteen in all, met in the Commercial Department of WEAf and requested his presence before them. He was presented with a handsome white gold watch and a sheepskin scroll with an appreciative inscription.



STANDARD
**Centralab
Radiohm**

*In Rebuilding an Old Set,
in Building a New Set —
Use Centralab Radiohms for
Greater Efficiency —*

MOST any radio circuit is improved by using Radiohms of proper value. They hold that sensitive position just preceding oscillation that gives greatest distance, volume and tone, and their adjustment is always gradual and noiseless. They give full control of tone and volume. They provide "B" battery voltage control for the new detector tubes or for "B" Eliminators. Radiohms are furnished in resistance values for every radio purpose, all smoothly variable to zero with a single turn of the knob. **\$2.00**

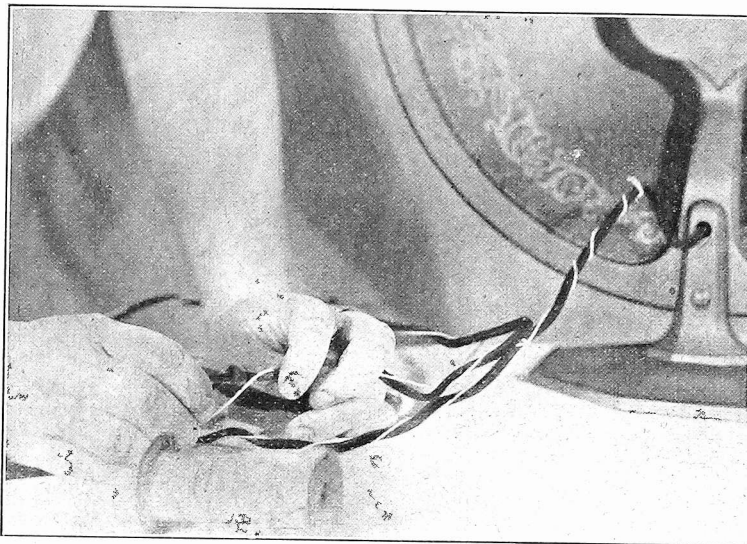
See your dealer, or write for circuit booklet.

CENTRAL RADIO LABORATORIES
13 Keefe Ave., Milwaukee, Wis.

Use radio parts of proven high quality. Centralab Radiohms and other variable resistances are used by sixty-nine well known set manufacturers.

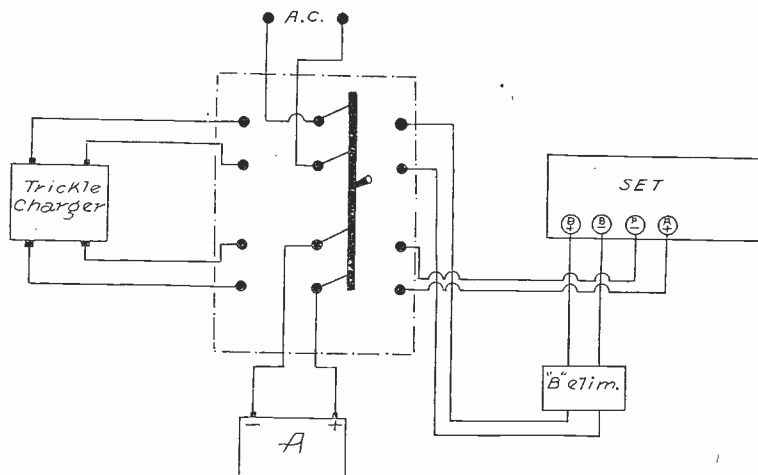
Centralab

GROUNDING LEAD AIDS SPEAKER



(Hayden)

WRAPPING magnet wire around the length of your speaker cords, and grounding the one end, makes a radio frequency shield for the speaker cord. This helps prevent the annoying hum sometimes present in speakers.



A FOUR pole, four throw switch, as diagrammed above, can be used to a great advantage, if you are the owner of a B eliminator and trickle charger unit. When the switch is turned to the left, the trickle charger is connected to the mains and A battery. When turned to the right, the B eliminator is connected to the line, while the A battery is connected to the set.

SPECIAL PREMIUM SUBSCRIPTION OFFER

For NEW RADIO WORLD Subscribers Ordering NOW

Radio World has made arrangements

—To offer a year's subscription FREE for any one of the following publications with one year's subscription for RADIO WORLD

—RADIO NEWS or —BOYS' LIFE or
—POPULAR RADIO or —RADIO DEALER or
—SCIENCE AND INVENTION or —RADIO (San Francisco) or
—RADIO AGE.

This is the way to get two publications

—for the price of one:
—Send \$4.00 today for RADIO WORLD
—for one year (regular price
—for 52 numbers)
—and select any one of the other
—nine publications for twelve months.

—Add \$1.00 a year extra for
—Canadian or Foreign Postage.
—Present RADIO WORLD subscribers
—can take advantage of this offer by
—extending subscriptions one year
—if they send renewals NOW!

RADIO WORLD'S SPECIAL TWO-FOR-PRICE-OF-ONE SUBSCRIPTION BLANK

RADIO WORLD, 145 West 45th Street, New York City.

Enclosed find \$6.00 for which send me RADIO WORLD for twelve months (52 numbers, beginning... and also without additional cost, Popular Radio, or Radio News, or Science and Invention, or Radio Dealer, or Radio (San Francisco), or Radio Age, or Boys' Life (or \$10.00 for two yearly subscriptions). (No other premium with this offer.)

Indicate if renewal.

Offer Good Until

December 18, 1926

Name

Street Address

City and State

NEW **DIAMOND OF THE AIR**
 Manufactured by the Clapp-Eastham Co. Licensed under ARMSTRONG
 PATENT No. 1,113,148 exclusively for BRUNO RADIO CORP.
 Complete Kit of Parts, with Blueprint; **\$37.50**
 ready to wire, as specified by BERNARD

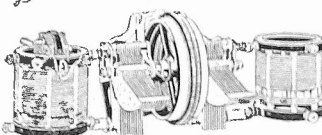
Bernard KIT
 6-tube Wonder Circuit. Complete Kit **\$40**
 of Parts with Blueprint, ready to wire..

THE FOUR TUBE DIAMOND
 Complete Kit of Parts, as specified by HERMAN
 BERNARD, with booklet, ready to wire..... **\$30**

B. C. L. RADIO SERVICE, INC., Dept. R.W.,

221 Fulton Street, New York City

BRUNO UNITUNES



BRUNO UNITUNE 2CB, with two .00035 Condensers, used in the BERNARD. Price, complete, assembled **\$11.00**
 2C, with two .00035 Condensers..... **\$11.00**
 1K (illustrated), the same, with BRUNO 1
 receiver Tuner..... **\$20.00**
 Model BD for BROWNING DRAKE circuit, **\$21**
 We can supply all BRUNO UNITUNES
 We can supply all parts for RADIO WORLD
 Circuits. Mail Orders Filled Promptly.

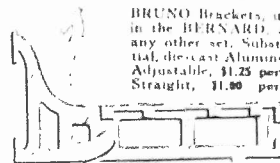
Send for Booklet



"BRUNO 80" — 3-
 circuit Tuner, spec-
 ially designed for the Diamond
 of the Air and other
 good circuits. **\$5.50**

"BRUNO 80" —
 Matched H.F. Coil
 for 29 Tuner. Used
 in the Diamond of
 the Air and other
 good circuits. **\$3.00**

BRUNO Brackets, used
 in the BERNARD, and
 any other set. Substan-
 tial, die-cast Aluminum
 Adjustable, **\$1.25** per pr.
 Straight, **\$1.00** per pr.



PERFECT FILAMENT CONTROL
 in the
"DIAMOND OF THE AIR"
 Is Assured with AMPERITE
 Eliminates hand rheostats. Simplifies set wiring. Ac-
 cepted as the only perfect filament control in every popular
 construction set

Radiall Company

Dept. R.W.20, 50 Franklin St., N. Y. City



Write for
**"RADIALL
 BOOK"**

AMPERITE
 The "SELF-ADJUSTING" Rheostat

Bernard BLUEPRINTS

Panel, Subpanel **\$1.00**
 and Wiring.....

Price includes Herman Bernard's article on how to
 build this 6-tube tone marvel.

Or send \$6 for one year's subscription (52 num-
 bers) and get blueprint, article and panel name-
 piece FREE!

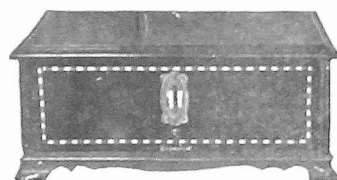
RADIO WORLD
 145 West 45th St. New York City

Specified by Bernard

Building Plans, Antenna and Ground guaranteed by
 American Radio Hardware Co., and the only parts
 which will function correctly in the Bernard kit
 Furnished with kit or sold direct for other circuits
 15c each.
 9 American Tube Tags will simplify your hookup.
 Furnished with kit or sold direct for any circuit
 15c per set

AMERICAN RADIO HARDWARE CO.
 Dept. W. 201 Lafayette St., New York City

A 6-TUBE CIRCUIT
 BEAUTIFUL
 TO EAR AND EYE



How to Build the

Bernard

This Nameplate Free to All!

Fully described in the October 16 issue of
 RADIO WORLD by Herman Bernard.
 Schematic and picture diagrams of the
 wiring, textual wiring directions, step by
 step: striking photographs of the com-
 pleted receiver, all treated so that the
 veriest novice in radio can build the
 Bernard.

THE SET YOU TUNE
 WITH YOUR THUMB!

Send 15c for October 16 issue

Blueprint of panel, subpanel and
 wiring (complete), with Bernard's
 constructional article **\$1.00**

Or send \$6 NOW for one year's subscription
 to Radio World (52 numbers) and get the
 blueprint FREE; also the October 16 issue
 FREE, and panel nameplate FREE! Keep
 informed on this fine circuit by reading
 Radio World.

RADIO WORLD

145 West 45th St. N. Y. City

AEROVOX

"Built Better"

Fixed Condensers and Resistors

Specified by Herman Bernard in the

"DIAMOND OF THE AIR"

and in his newest marvel, the

Bernard

Registered U. S. Patent Office

The 6-Tube Receiver of Exquisite Tone

Specified by Dr. Louis B. Blan

in the new **ANTENNALESS**

AEROVOX products are also used in
 over thirty leading circuits and "B"
 ELIMINATORS.

—THERE'S A REASON!

Aerovox Wireless Corp.

489-491-493 Broome St., New York City

BLUE PRINT and Book, DIAMOND OF THE
 AIR sent on receipt of 50c. Guaranty Radio Goods
 Co., 145 West 45th Street, New York City.

How to Build THE DIAMOND

5-Tube Model

Herman Bernard designer of this wonder cir-
 cuit, has written an illustrated booklet on "How
 to Build Radio World's Improved Diamond of
 the Air." Send 50c and get this booklet, in-
 cluding a full-sized wiring blueprint and free
 namepiece.

Outstanding Features of Set: (1) Fans, charmed
 by tone quality, sensitivity and selectivity, re-
 port speaker reception of far-distant stations
 with great volume. (2) A 2-tube earphone set,
 a 5-tube speaker set, and a separate 3-stage
 audio-amplifier for immediate use with any
 tuner, are combined in one. (3) No rheostats
 are used. (4) The set is inexpensive to con-
 struct and maintain. (5) The set works from
 outdoor aerial or loop; hence no aerial problems
 present themselves, in city or country.

Send \$6 for year's subscription and get booklet,
 blueprint.

[Newsdealers or radio dealers, order the book-
 lets with blueprints included, in quantity, direct
 from American News Co. or branches.]

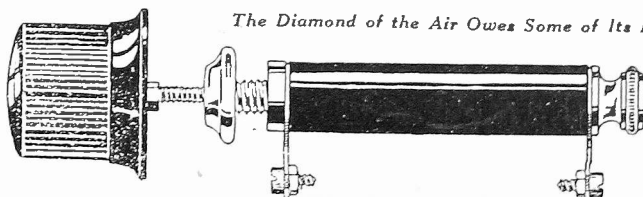
RADIO WORLD

145 West 45th St., New York City

THE BROWNING-DRAKE CIRCUIT—Text and
 illustrations covering this famous circuit starting
 with our issue of Aug. 14. The 3 numbers sent
 on receipt of 45c. RADIO WORLD, 145 W. 45th
 St., N. Y. C.

THE BRETWOOD

Variable Grid Leak
 Certified for
 The Diamond



THE BRETWOOD

Improves Any Set!

Price, \$1.50

NORTH AMERICAN BRETWOOD CO., 145 West 45th Street, New York City

The Diamond of the Air Owes Some of Its Efficiency to This Leak

TIPS ON MAKING A 3-FOOT CONE

By Thomas Force

Acoustic engineers first discovered that amplification in a cone speaker is caused by resonance in the cone in circles six inches in diameter, the circle around the tip providing the resonating area for the highest set of frequencies, the next circle providing for another set, etc., until the sixth or last, providing the lowest, so that a 36" cone is able to resonate at practically all frequencies, low or high, within the range of audibility. Hence, a properly designed and constructed 36" cone speaker has proven very popular.

Persons with an ear for music readily appreciate the quality of reproduction pro-

vided by this type of speaker. My friend and contemporary, James H. Carroll, having built a 36" cone and boasted about it, I resolved to build one, choosing a double cone for my experiment. This cone proved to be a simple and inexpensive job.

The magnet is 16 oz. size, cyanide hardened. The driving rod is short, operates through a brass sleeve, and does not extend beyond the cone. These features make the cone strong and durable.

Starting the job, first lay out your parts (1) then study directions carefully.

To use as a compass get a slat of wood about two feet long, $\frac{1}{4}$ " thick and 1" wide. About 2" from the end and in the middle of the slat drill a hole just large enough to take the point of a pencil. Eighteen inches from the center of the hole drive a nail. This serves as a compass for the front cone. Another nail hole should be made $\frac{1}{2}$ " nearer the hole for the pencil—17 $\frac{1}{2}$ " away. This serves as a compass for the back cone. Lay one of the sheets of paper on the floor, turning the side up that shows a little grain. Determine the exact center, draw a 36" circle and cut out with a sharp knife. Look at the rough side and you will see dark, rippling streaks running in one direction. In line with these and from the exact center of cone cut a slit.

Next measure a point 5 $\frac{1}{2}$ " away in a straight line from where the slit cuts the periphery or outside rim of the cone. Mark this point and draw but do not cut a line to this point from the center. Then measure another point $\frac{1}{4}$ " nearer the slit and cut. Remove the cut segment and you have a flap $\frac{3}{4}$ " wide for cementing. Punch a $\frac{1}{4}$ " hole in the center of the disc. Spread the Ambroid cement on the flap and bring the cut edges so that the flap is on the inside of the cone. Smooth carefully, put weights on the cemented parts and let dry.

This forms the front cone with exactly the correct angle for tone quality. Now take the larger brass disc which comes with the Penn cone speaker unit, cover it with Ambroid and cement it carefully

to the inside of the apex of the cone, being sure that it is in the exact center. Then, in a similar manner cover the smaller brass piece with Ambroid and cement on the outside of the apex of the cone.

Draw this circle exactly 35" in diameter. Then from the exact center draw another circle exactly 16" in diameter, (8" in radius). Do not cut this out before the cone has been cemented and is perfectly dry. Then the segments are cut as for the first cone and cemented in the same way.

As I am aware that many skilled at making sets are not so handy at making a speaker, I will be glad to answer questions on this topic. Address me care of RADIO WORLD, 145 West Forty-fifth Street, New York City.

LIST OF PARTS

- One Penn Cone Speaker Unit.
- Two sheets Alhambra Fon-O-Tex, 38" x 38".
- One set Penn Back Rings.
- One set Unit Mounting.
- One 5-oz. can Ambroid cement.



World Radio Storage "B" Battery

12 Cell—24 Volt

Proved value. Thousands of users find reception almost magical. Clear, true power—instantly and unendingly. Wise economy. Sturdy construction—Solid Rubber Case protection. Recharged for almost nothing. Endorsed and listed as standard by famous Radio institutions including Pop Radio Laboratories, Pop. Sci. Inst. Standards, Radio News Lab., Lefax, Inc., and other Radio authorities. What more need be said? Extra Offer: 4 Batteries in service (66 volts) \$19.00. Send No Money. Just state number wanted and we will ship same day order is received, by express C. O. D. Pay express and battery. 6% discount for cash with order. Remember—you save 50% on World Batteries.

WORLD BATTERY COMPANY

1219 So. Wabash Ave. Dept. 82 Chicago, Ill.
Makers of the Famous World Radio "A" Storage Battery
Prices: 6-cell, 100 Amp. \$10.00; 120 Amp. \$12.00; 140 Amp. \$15.00.
All equipped with Solid Rubber Case.

Set your radio dial at 228.3 meters for the World Storage Battery Station W3BC. Variety-New Talent—Always interesting.

JERRY SULLIVAN—Director and Announcer—"CHI-GA-WO"

RADIO WORLD'S QUICK-ACTION CLASSIFIED ADS.

10 CENTS A WORD
10 WORDS MINIMUM.
CASH WITH ORDER.

OVER TWO POUNDS BUILDER'S DATA, catalog, circums—25c, prepaid. Twenty weekly mailings, newest "dope," \$1.00. Kladag Laboratories, Kent, Ohio.

SEND FOR PAMPHLETS OF THE GOOD-MAN TUNER—In use for years and still good. Tested and approved by many technical laboratories. L. W. Goodman, Drexel Hill, Penna.

ADDING PENCIL: Amazing new invention. Everybody interested. Millions can be sold. Make \$20 or more daily. Get your sample now. Add-O-Graph Pencil Co., D-84, St. Louis, Mo.

PATENTS—Write for free Guide Books and "Record of Invention Blank" before disclosing inventions. Send model or sketch of your invention for our Inspection and Instructions free. Terms reasonable. Radio, Chemical, Mechanical, Electrical and Trademark experts. Victor J. Evans Co., 924 Ninth, Washington, D. C.

SICKLES

Shielded Tuned Radio Transformer
The ideal coil for the Na-ald Localized Control Tuning Unit, and for Truphonic Cat-comb A-assembly.
Widely adaptable to all leading control units. This transformer is compact, sturdy, sharp-tuning. Prevents both outside and local interference.

PRICE \$2.00
Send for catalog
OTHER SICKLES

No.	Coil	Prices
24.	Browning-Drake	\$7.50 Set
18A.	Roberts Circuit	8.00 Set
25.	Aristocrat Circuit	8.00 Set

THE F. W. SICKLES CO.
140 UNION STREET
SPRINGFIELD MASS.

IT HOWLS

Now it doesn't!

Mc DONALD HOWL ARRESTER

(TRADE-MARK)

"It Stops that Howl!"

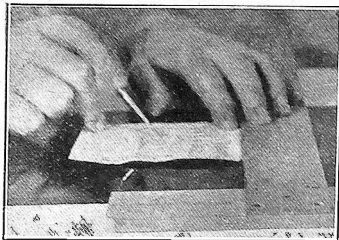
Slip one of these live rubber jackets over each trouble-making tube . . . and the Howl stops.
Remember the name! You can get it for every size tube. It sells for 75c each. Just ask your dealer, or write.

Sole Selling Agents for the U. S. A.
SPARTAN ELECTRIC CORPORATION
350 West 34th Street, New York City

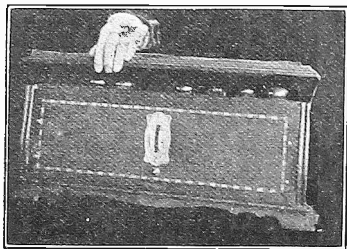
Manufactured in the U. S. A., by the
SCIENTIFIC PRODUCTS CANADA, LTD.

"It Stops that Howl!"

ON THE SQUARE



WHEN using one of the templates for the new cut-out drum dials be sure to get it square with the panel by using a T square, or ruler.



WHEN laying out parts for set construction be sure your subpanel is low enough to allow tubes to clear the cabinet lid.

THE ANTENNALESS

(Concluded from page 3)

control. While R2 stops self-oscillation under conditions of correct placement of coils, it is not 100 per cent. effective unless magnetic back coupling is kept at a minimum.

[Part II, the conclusion of this article, will be published next week, December 4, in the Holiday Gifts Number. Photographs of the receiver will illustrate the instalment.]

LIST OF PARTS

- GFPB—One Acme R3 transformer.
- L1L2, L3L4, L5L6—Three Benjamin 2½" diameter transformers.
- TR1, TR2, TR3—Three Truphonic couplers (include built-in coupling condensers).
- OU—One Alden output unit (includes condenser).
- C1, C2, C3—Three Benjamin .00035 straight line frequency variable condensers.
- R3—One Electrad 2-ohm rheostat.
- R2—One Electrad 200-ohm potentiometer.
- C4, C5, C6, C7, C9—Five Aerovox .001 mfd. fixed condensers.
- C8—One Aerovox .00025 mfd. fixed condenser with clips.
- C1—One Lynch metallized fixed grid leak, 2 meg.
- 1, 2, 3, 4, 5, 6, 7—Seven Benjamin Cle-Ra-tone spring supported shock-absorbing sockets.
- J—One Electrad single circuit closed jack.
- S—One Benjamin battery switch.
- Three National Velvet Vernier dials.
- One 7x24" Bakelite front panel.
- One 8x23" Bakelite subpanel.
- One pair of Benjamin adjustable brackets.
- Two flexible leads for C battery.
- One 7x24" cabinet.
- One Swan-Haverstick aerial kit.
- One Polymet phone plug.
- One loud speaker.
- Three CeCo type A tubes (sockets 1, 2 and 3); one CeCo type H tube (socket 4); two CeCo type G tubes (sockets 5 and 6); one CeCo type F tube (socket 7).

RADIO WORLD'S

Most important issue of the year

HOLIDAY

GIFTS NUMBER

December 4th

Editorial Features

The DX Getter. A 5-tube circuit. One of the most selective and penetrating hookups for home constructors. By Capt. Peter V. O'Rourke.

The Bernard Lamp Socket Set. How to construct the famous Bernard receiver and a B eliminator, so that it may be operated without need of battery replenishment. By Herman Bernard.

"The Christmas Spirit"—A front cover design in two colors. By J. Gerard Sheedy, art director of Radio World.

A D.C. Eliminator of A, B and C. Batteries. By Lewis Winner, technical editor, Radio World.

Common Fallacies in Radio. By J. E. Anderson, consulting engineer.

A Beat Note Audio Oscillator. By John F. Rider. Full Page of Fascinating Photographs of the latest happenings in radio.

Tell your newsdealer to save you a copy—15c.

Advertising Results

Radio World's Annual Holiday Gifts Number brings the maximum results to its advertisers. This issue will be advertised to some ten million people in other publications, and generally sells from forty to fifty thousand in addition to our 100,000 weekly circulation. It reaches the buyer just at the time when he is planning what he will give for Christmas.

Radio is the Most Appreciated Xmas Gift

This issue will tell what is best to buy and where to buy it.

Radio World's Holiday Gifts Number is dated December 4; is on newsstands December 1. Red form goes to press Monday morning, November 22. Last black form closes Tuesday noon, November 23. Full-page advertisers, on request, get an extra color—red—without additional charge. All advertisers get thousands of extra circulation without additional charge. Advertising rates: \$10 an inch; \$100 a column, and \$300 a page.

RADIO WORLD

145 West 45th Street New York

FRED S. CLARK, Adv. Manager

Bretwood Bullet Condenser

for Your Detector Grid
Circuit



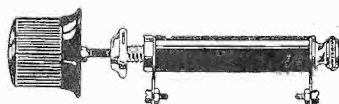
Capacity .00025 mfd. (actual size)

It Hits the Mark Every Time

Price 60 Cents

Just the Thing to Make Your
Detector Circuit Sensitive.

Let the Best Be None Too Good for You!



Precision Range, 1/4 to 10 Megohms

Connect a BRETWOOD Variable Grid Leak in the detector circuit of your set and turn the knob until the signals clear up beautifully.

Use a BRETWOOD Variable Grid Leak across your last stage audio transformer, or put one in place of the fixed leak in the final grid of impedance or resistance coupled audio. Turn the knob and note the a m a z i n g improvement in quality.

In any circuit where a grid leak has to be used its value in ohms is important. Conditions differ in individual circuits and with different equipment. Experts cannot specify definite values that are applicable to all cases. The variable leak takes the guesswork out of the grid circuit, and the BRETWOOD is the best for the purpose. "It Does the Trick!"

NORTH AMERICAN BRETWOOD CO.,
143 West 45th Street, N. Y. City

Enclosed find \$1.50, for which send me one Bretwood Variable Grid Leak (or \$2.00 for leak with grid condenser attached) on five-day money-back guarantee. (Condenser alone, 60 cents.)

NAME

STREET ADDRESS

CITY and STATE

(Inquiries Invited from the Trade)

Leadership

with Benjamin Radio Products
in Securing the Best Radio Results



All Benjamin Radio Products are of the same high standard as the far-famed Cle-Ra-Tone Sockets

You will find that almost every good radio set in the neighborhood has some or all Benjamin Radio Products in it. Radio experts and set makers have proved through long experience that only radio parts conscientiously and painfully made to improve delicate tonal quality, selectivity and volume can bring a leadership in securing the best radio results.

If you would have your set just as good or better than your neighbor's make sure that every component part is reliable and bears the trade mark of a manufacturer in whom you can place your full confidence. The world-wide recommendation of Benjamin Radio Products by radio authorities is the best testimonial for their scientific accuracy and uniformity in securing the best radio results.

Rewards for Radio Reasoners

Awards for novel and original hook-ups, modifications of existing circuits; trade names; slogans; write our nearest office for full details.

If your dealer cannot furnish you with Benjamin Radio Products send amount direct to our nearest sales office with his name and we will see that you are promptly supplied.

Benjamin Electric Mfg. Co.

120-128 S. Sangamon St.

Chicago

New York:

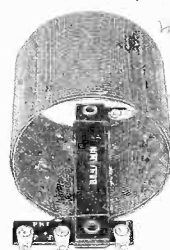
San Francisco:

247 W. 17th St.

448 Bryant St.

Manufactured in Canada by the Benjamin Electric Mfg. Co. of Canada, Ltd., Toronto, Ontario

Improved Tuned Radio
Frequency Transformers



Space wound; basket weave; cylindrical; highest practical air dielectric. Proved to give the best results in sharpness of tuning, increase in volume and improvement in quality. Authoritative laboratory tests and practical experience of manufacturers and amateurs shows that this type of coil excels in every important characteristic.

2 1/4-inch Diameter
Transformer

Compact. Especially desirable for crowded assembly. Eliminates interfering "pick-ups."

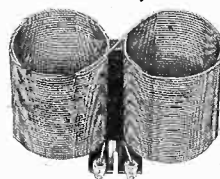
Set of Three, \$5.75
Single Transformer, \$2.10

3-inch Diameter
Transformer

Capacity coupling reduced to lowest degree. For use with .00035 Mfd. Condensers.

Set of Three, \$6.00
Single Transformer, \$2.25

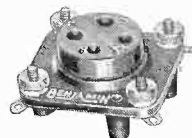
"Lekeless"
Transformers



Uniform high inductance; low distributed capacity and low resistance. The external field is so slight that it permits placing coils close together without appreciable interaction.

Single Transformer, \$2.50

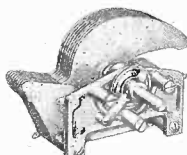
Cle-Ra-Tone Spring
Supported—Shock-Absorbing Sockets



Spring Supported, Shock-Absorbing, Stop Tube Noises. The greatest aid to non-noisy operation. Contacts always clean.

75 cents each

Straight Line Frequency Condensers



Eliminates bunching of stations. Spreads the log evenly over the dial. Makes tuning easy. Adjustable turning tension. Compact. A beautiful instrument that not only improves reception, but adds to the good appearance of the set.

.00025 Mfd., \$5.00
.0005 Mfd., \$5.50
.00035 Mfd., \$5.25



Brackets

An aid to simplification in set construction. Supports the sub-panel, with room underneath for accessories and wiring.

Plain—70c pair. Adjustable—\$1.25 pair

Battery Switch

Quick, positive, clean-cut make and break. When it's "off," eliminating danger of wasteful use of battery.



30 cents each